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December 1927 10 Cents

The Pocket Book of Agriculture

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and a

Happy and Prosperous

New Year

Agricultural and Scientific Bureau

N.V. POTASH EXPORT MY.

of Amsterdam, Holland

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Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

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VOLUME X NUMBER ONE

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Agricultural and Scientific Bureau
N. V. POTASH EXPORT MY.
of Amsterdam, Holland
Directors: J. N. HARPER G. J. CALLISTER

BACHRACH

"'Twas the night before Christmas!"

Better Crops with Plant Food

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Vol. X NEW YORK, DECEMBER, 1927 No. 1

"The Lord loveth
a cheerful giver"

Generosity

By Jeff McDermid

WHEN the world knows so well that Andrew Carnegie gave millions of books, and General MacDuff gave thousands of blows, how can it persist in calling the Scotch race a "close" one? In the same age that we have said, "Lay cornerstones, Carnegie," and "Lay on, MacDuff" we have been guilty of calumny against a canny set of folks whose attribute lay not so much in parsimony as in "purse o' money." They were good at acquiring the world's desirables, but not reckless in dispensing them. They knew and acquired values; and so Scotch thrift became a jibe in the mouths of wastrels and go-easies.

The goofer who told me the last, worst Scotch joke was *sitting* in a street car while a charwoman from Argoyle *stood* in front of him holding a baby and a heavy market basket. She was doing more for her country on fifteen dollars a week than he ever dreamed of doing on the royalty from his oil wells. He didn't seem to realize that a gentleman can be generous by just getting up off the seat of his pants in a crowded Broadway car.

Charity begins at home all right; but in his case there wasn't anybody home!

And that's the trouble about generosity in America. We don't think it through. To many of us generosity means to let go of something very valuable—and to our crazy notions these days value always means money.

Ordinarily public generosity is called

philanthropy. Philanthropy means benevolence and good will towards *all* humanity, with or without press agents. It *should* be able to operate sometimes without newspaper headlines to keep wealthy rivals informed of each other's progress in the donation marathon. Sad to say, most of our public benefactors are hunting for the nearest broadcasting station of large wave length rather than modestly seeking for the proverbial bushel.

ON the other hand, it is easier to be rich and stingy than to be rich and generous, if you count the cost and bother of social secretaries and charity dispensers in your office.

Your real stingy Scrooges are left alone, but once let a moneyed man give to some importunate jigger, and the whole hungry pack are at his heels. Thus there is some credit coming to these wealthy hand-out boys, and I mustn't fail to give them justice, although it comes hard to sing lofty praises to those whose chief philanthropy lies in kissing good-bye to soft dough.

As you will recall (if you are old-fashioned in your reading) there was once a Rich Young Ruler who got the Best Advice obtainable on this subject. It was in Palestine one day when the said R. Y. R. was speculating upon what use he should make of his talents —the coin kind mostly. As that was before the days of air ships and long distance swimming matches, there was no quick way to let go of it without either a headache or a hold-up. So he sought Help in the matter. The presumption is that he took the Advice, and found that if he gave *all* of *himself* along with a little of his wealth, he would be more serviceable to the world than if he doled out material charity through his flunkies.

Blustering gustoes of oratory have been jabbered at many a scene of public benevolence, with no ring of force or truth. The capital S in Sentiment has been crossed too often at such times with two perpendicular parallel bars.

Edmund Burke rarely got heated to perfervid rhetorical pitch unless there was a good and sufficient reason for high pressure oratory. In 1780 Burke paid one of his most eloquent tributes to a certain philanthropist, John Howard, High Sheriff of Bedfordshire. Burke exclaimed:

"He has traveled to the uttermost ends of the earth, not as others did for pleasure, but to remember the forgotten, attend to the neglected, to visit the forsaken. His work has been as full of genius as it was of humanity; it was a voyage of discovery; a circumnavigation of charity."

John Howard's memorial statue was the first one placed in St. Paul's cathedral; not because he happened to be a wealthy citizen who lavished with his checks, but because, from London to Moscow, from France to Smyrna, John Howard did more in twenty tireless years for real prison reform than any single individual has accomplished before or since. Finally he earned the laurel crown under that greatest and noblest of captions: "Greater love hath no man than this"—for he died of camp fever in a Turkish prison.

Contemporary with Howard in that selfish and swashbuckling era was James Oglethorpe, who left a life of softness to lead a colony of Moravians, Scotch Highlanders, and Cheapside prison outcasts, with the solemn Wesley Methodists to boot, into the unknown hinterlands of Georgia. County agents of the Savannah coast region must not take too much credit to themselves for being pioneer reformers and philanthropists down there. James Oglethorpe carried out a job that was even worse to tackle than Henry Ford undertook on the troublesome voyage of the *Oscar II*.

This brand of dare-and-do philanthropic philosophy is scarce these days perhaps. It is so much easier to wait

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The busy terminal market shown in this photograph is in Los Angeles, Cal.

America's Markets

By Frank George
U. S. Department of Agriculture

¶ First of a series of articles on the process of getting the nation's food supply from producers to consumers

A TOUR of America's great consuming markets impresses one with the immensity of the job of feeding 120,000,000 people. While the city sleeps an army of distributors from wholesalers to retailers are hauling, storing, or placing on display the food supply for the ensuing day. Railroad terminals, wholesale markets, produce auctions are a bedlam of noise and confusion. A day's supply of farm produce at a single market is measured in hundreds of carloads, valued at hundreds of thousands of dollars.

The quantities of food supplies at some of the big consuming markets have practically doubled during the last 10 years, taxing to the utmost the machinery of distribution. New terminals have had to be erected in some places to handle the Gargantuan food supply, and plans projected for relocating city distribution centers. The marketing facilities of 10 years ago have become antiquated and inadequate to meet the needs of increasing millions of consumers.

New York City alone now receives in a year more than 76,000 cars of 10 leading fruits and vegetables compared with 48,000 cars in 1920; Chicago gets 40,000 cars of these products against 27,000 cars seven years ago; Philadelphia receives 21,000 cars compared with 17,500 cars in 1920; Detroit 13,000 cars against 6,000 cars; Cleveland 10,600 cars against 7,500 cars. These receipts, except in the case of New York City, do not include less-than-carload supplies received by motor trucks and farm wagons.

Carlot shipments of leading fruits

and vegetables now total upwards of 1,000,000 cars a year, compared with 500,000 cars 10 years ago. Per capita consumption of meats has decreased somewhat, but the total consumption has increased. Total consumption of all food and fiber products has increased tremendously during the decade. Foods that were formerly regarded as seasonal products, such as lettuce, celery, and citrus fruits are now eaten the year round.

The Reasons Why

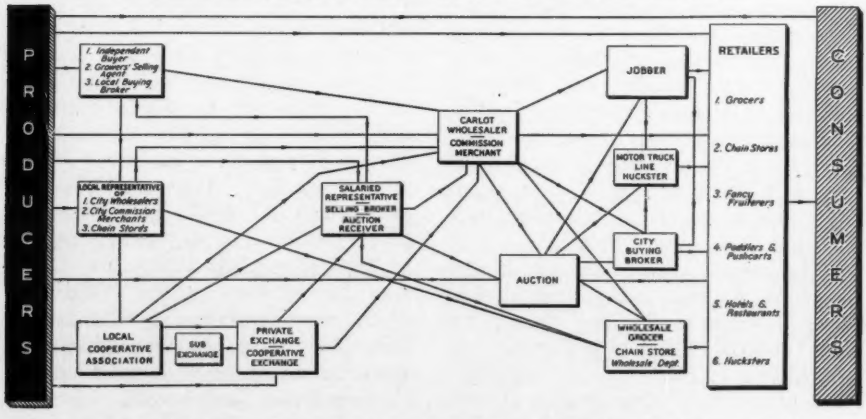
Increased population, higher living standards, and cheap transportation are the outstanding reasons for this increased consumption of food products. Population has increased approximately 15,000,000 persons in the last decade, practically all of the increase occurring in urban centers. Higher standards of living have come about chiefly through an uninterrupted period of relatively high industrial wages, and the continuous campaigns waged by public and private institutions in effecting better dietary.

Time was when only consumers in large centers of population were able to buy the entire range of products from American farms. Thousands of small communities had to go without citrus fruits and many of the vegetables such as lettuce and celery because they did not provide sufficiently large consumption outlets for such commodities. But now as a result of scientific refrigeration and heating in transit, cheap rail transportation, the advent of the motor truck, and the development of more efficient systems of distribution, the consumer in the small market is on a parity with his city cousin in choice of foods.

Fleets of motor trucks are hauling products within a 200-mile radius of consuming markets, and placing the food in the trading centers in better condition than is possible by rail or water transportation. The strawberry growers on the eastern shore of Maryland and Virginia this season, for example, shipped one-third of their 3,300 cars of strawberries by motor truck to markets as far north as Albany, New York. Asparagus growers of the Morrisville section of eastern Pennsylvania similarly are using motor transportation to Newark and Jersey City. Other examples could be cited.

Shippers who use motor transportation declare that with good roads there is less injury to products in motor trucks than in freight cars. The products are loaded at the orchard or packing house during the late afternoon and hauled to market when the temperature is falling, so that the load is well ventilated and cooled en route.

AGENCIES AND CHANNELS OF DISTRIBUTION FOR FRUITS AND VEGETABLES



An array of wholesalers, brokers, jobbers, and retailers handle the nation's food supply.

This beautiful stretch of country with its many orchards is in Hood River Valley, Oregon. Large commercial producing areas are being developed thousands of miles from consuming markets.

Rail transportation requires the produce to be loaded at the farm, hauled to shipping point, unloaded on the platform, and loaded later in the cars; and at destination, unloaded, loaded on trucks, and unloaded at the wholesale markets. The motor truck eliminates most of the handling, effecting virtually farm to market delivery.

Using Motor Trucks

Many distributors in small markets who formerly received mixed carloads of produce from larger consuming centers, now are using motor trucks. A dealer in Beaver Falls, Pennsylvania, for example, telephones a produce broker in Pittsburgh to make up a car of mixed fruits and vegetables. The produce is loaded in a motor truck, and within a few hours it is received at Beaver Falls. There is no delay to secure a freight car, a minimum of handling expense, and the products arrive in fresh and wholesome condition.

Appreciating the need for larger and more modern terminal facilities to handle the steadily increasing volume of business, the railroads during the war had projected plans for building more efficient structures in the receiving markets. To be sure, they had an eye for business, for the road which had the better facilities would get the haul. These projects had to be postponed, however, because of the wartime restrictions on commercial building, and immediately following the war high building costs were a further deterrent.

The need for better terminals became increasingly imperative by reason of the increase in urban population which meant larger volume of shipments, and despite the costliness of present-day construction, building was begun on a number of projects. New terminal facilities have been built or are in course of construction in Boston, Philadelphia, Cleveland, Pittsburgh, Newark, Los Angeles, and other markets. The number of auctions at consuming centers also has increased where farm products are sold with lightning-like speed in a free supply and demand market.

While marked changes have occurred on the consumer side of the ledger in the last 10 years, there have

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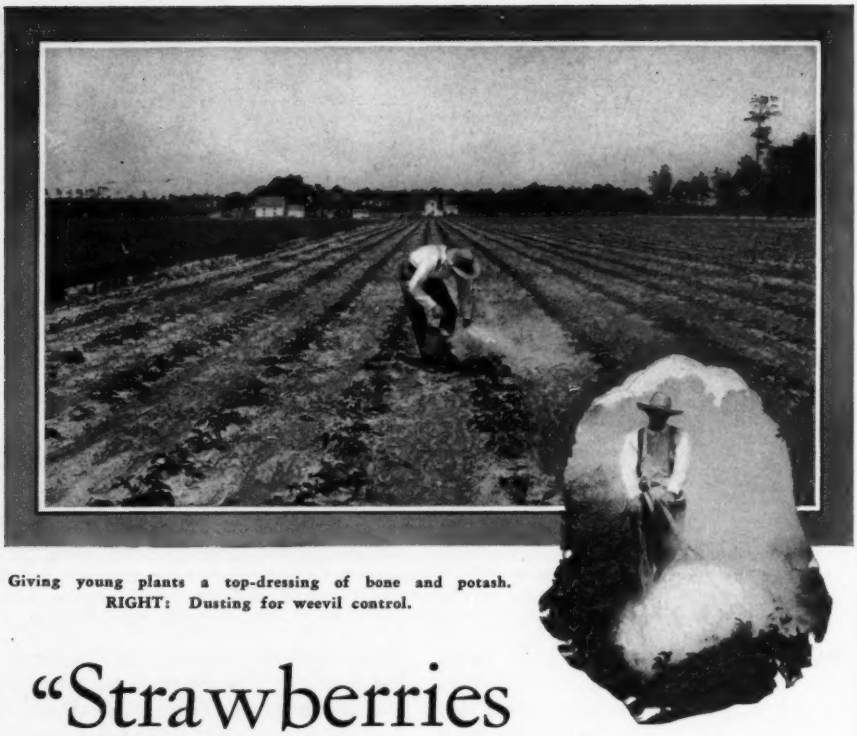


Giving young plants a top-dressing of bone and potash. RIGHT: Dusting for weevil control.

"Strawberries Were My Salvation"

—PAUL GUNBY

By William J. Maddox

SEVENTEEN years ago, when Paul Gunby moved back into the "pine thicket" to reclaim the old homestead, the place might very well have been rated as abandoned.

The Gunbys still owned it. Five generations of Gunbys had tilled that selfsame soil, going back to pre-Revolutionary days. They had taken their crops—mostly wheat, corn, and oats—and left it largely for nature to repair the damage.

They were no different from their neighbors. That was pretty generally the practice on the Eastern Shore of Maryland, on the peninsula that comes down between Chesapeake Bay and the ocean and contains also the state of Delaware and a fragment of Virginia. It did no special harm—that is, none that was noticeable from year to year as crops went in those days. Land was fairly plentiful and labor was next to nothing. At least that was the popular fallacy with respect to slavery.

People lived well. Good food and plenty of it was the tradition. If bigger or better crops were needed, new fields were brought in. And in this way things evened themselves up very nicely.

Just before Paul's day, though, the overworked land showed symptoms of balking. The crops had shrunk to such a thinness that the Gunbys decided it was a losing game to stay there, and so moved to another farm.

The old place was left to shift for itself.

Let it be understood right now that it was not sentiment that took the young Gunby back. There wasn't any room for him to set up for himself in the new neighborhood into which his people had moved. Then, too, he wasn't flushed with money, and the old place was about the only one within his means.

So he went back into the "pine thicket" practically without a cent in his pocket. He staked all his cash, some $300, as the down payment to the rest of the heirs. In addition he gave them a mortgage of $3,000.

In all there was about 128 acres. Some of the fields had been out of cultivation for 10 years, some were grown up in poles. The longer ones he disposed of to the fishermen at Crisfield, seven or eight miles farther down on the bay, for their fish pounds. The shorter ones he sold as bean poles. He made enough from them to pay for clearing the land.

There was only one barn on the place.

Strawberries went into the first cleared patch the very first season. They were comparatively a new crop on the Eastern Shore 25 or 30 years ago.

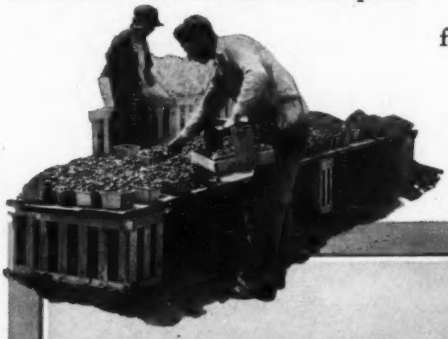
For Gunby, they were money-makers from the start.

"Strawberries have been my salvation," is what he says of them today.

Mortgage Is Paid

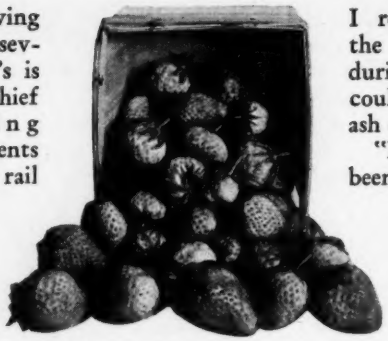
The first two crops paid off the mortgage. And with this out of the way he was free to put more back into the soil to make up for what it had been losing all those years. In addition he has added more acreage. The first was a tract of 74 acres, the next was 26 acres, now giving him in all 228 acres.

From the first Gunby set the pace for that part of Somerset county. It



LEFT: Packing strawberries for shipment. BELOW: Mr. Gunby with some of his pickers on the way to the packing shed.

is a strawberry-growing community. Within several miles of Gunby's is Marion, one of the chief strawberry shipping points. Direct shipments are made not only by rail to the big cities, but by truck overnight to points as far away as New York, getting there in time for the early morning market.



It costs Gunby around $80 an acre to raise his crop, and he keeps an accurate account of all his operations. He knows every season just where his money and time went and what he got in return for them.

"But," he says, "I'd rather pick 10 acres of 200 crates to the acre than 20 of 100 crates."

The average yield among growers in that part of the country is 50 crates to the acre!

In 1925, Gunby picked as high as 1,400 crates from one field of six and a half acres. Last season he didn't do so well. His average was slightly under 190 crates to the acre. For one thing he had a lot of trouble with a beetle that was particularly active with the young foliage. But on the whole he maintains a good average year in and year out.

Gunby is a consistent user of fertilizer and he makes it a practice to regularly put humus into the land. He lays his high yields to this. He has found a good combination of plant foods and he has worked out a method of applying it that satisfies him as to results.

"I've had people tell me I use too much fertilizer," he told me recently when I dropped in to see him. "They say I use too much potash, for one thing. But I don't think so. I mix a good deal of the fertilizer myself and I try varying the amounts. I watch the effect, making allowance, of course, for the season and such things. And I don't agree with them. I remember, too, what the patches looked like during the war when we couldn't get much potash or none at all.

"My experience has been that potash gives a redder and more solid fruit. And I believe, too, that it keeps the caps from rusting."

Which, incidentally, is in line with the practices of growers in New England, so I am told. It is getting to be generally understood that the well-fed plant resists disease better.

Mixed Fertilizers

For his mixed fertilizer, Gunby takes 1,700 pounds of bone and 300 pounds of potash (muriate). The bone is 4½ per cent. ammonia and 48 per cent. phosphate of lime. Combined in these proportions he should have a mixture that would give him roughly 3½ per cent. nitrate and 7½ per cent. potash. The customary mixture for that part of the country, which also grows a good many white potatoes, is 7-6-5. Gunby also uses 7-6-5, but not until the last application, just before picking. Practically all the growers use 7-6-5 throughout.

Where the average is about 300 pounds of 7-6-5 to the acre, Gunby uses from 500 to 600 pounds of his bone and potash mixture. This gives the plants a decidedly greater amount of potash, considering that the mixture contains about 7½ per cent.—roughly three times as much.

Gunby is a spring planter. He puts out his plants in late March or early April. His early variety is Missionaries and his late one is Gandies.

Unlike the growers a little farther south, around Norfolk where trucking is highly organized, Gunby grows no companion crops with his strawberries. So far he hasn't found this desirable.

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The Extension Worker

What he can accomplish in Agriculture and Business

By T. J. Talbert
University of Missouri, College of Agriculture

THE agricultural college extension work sells ideas as truly as the salesman of a private corporation sells goods. The insect control specialist sells the Hessian fly control idea; the chinch-bug, grasshopper, army-worm control ideas in the same way. The animal husbandry specialist sells the purebred sire idea to a community or neighborhood, while the home economics specialist sells the modern improvement of the farm home idea to the farmer's wife. This is all done in much the same way and by methods which are not strikingly different from those used by the extension representatives of business concerns and private corporations.

The qualifications of the salesman of ideas and goods are: 1, education and training; 2, practice or experience; 3, tact and resourcefulness; 4, ability to demonstrate or show; 5, ability to close the deal by honest methods and fair dealings.

Education and training are of the highest importance for either worker. Some may succeed without much education, but the great majority will be so handicapped without it, that little progress will be made. It is also true that those succeeding without an education, would in almost every case get further ahead if they had been given the advantage of an education.

The Educated Man's Chance

Statistics lately gathered show that among 150,000 uneducated children, only one has a chance of becoming prominent. Given a high school education, he has 87 times this chance; elementary schooling falls between these two while college training increases the opportunity 800 times.

Formerly farmers feared that ed-

Agricultural extension leaders at work. The group of farmers above are watching a demonstration of mixing spray materials. The group at right is discussing farm problems in the shade of a big oak in August.

ucated children would feel they had outgrown farm conditions and would look toward the city, but in these days when the automobile, the radio, modern household appliances, and especially the use of farm power machinery are increasing in every rural district, the farmer may well change this fear for the one that his children, unless well educated, cannot hold a leading position in their own community. The agricultural extension worker must have a broad general education, including practical farm experience and in addition to this a thorough training in the science of agriculture.

The extension worker of the private corporation should also have a broad general training and special training in the particular line which he represents. We all do best the things which we know best, and it follows that the salesman of goods who knows his line from A to Z in about 99 cases out of 100 is a success. On the other hand, either worker who will not take the time to inform himself properly is usually mediocre or more often a failure.

Experience for the worker is as important as education and training. Practice, practice is what makes a successful football or baseball team, and so it is with our extension workers for agriculture and private corporations. Schools of instruction are frequently maintained for salesmen who are beginning work or for those who wish to brush up on new lines of work. Agricultural colleges are also offering courses in extension methods and problems for the purpose of training those desiring to take up extension work.

Men and women of no other lines of work are required to exercise so much tact and resourcefulness. Neither class of workers can be successful without the exercise of discretion and a sense of proportions in handling the difficult and varied problems which arise from time to time. For instance, the specialist in Farm Crops who would have the farmers put into practice his teachings regarding the use of legumes, cannot call the farmers fools and back numbers because they hesitate or refuse to be interested in his teachings. He cannot afford to lose his temper when some one makes sport of his ideas and work. Neither can the salesman of goods afford to be disheartened or quit because he is ridiculed by prospects or fails to close a sale with some of his best customers. Such setbacks or reverses should make each of the workers try the harder, if they are the right ones with the proper training. If they continue to fail, however, there is something wrong with the workers and not with the people with whom they work.

The Demonstration Method

The values or advantages to be derived from the demonstration method of teaching are so generally known and emphasized that it is hardly worth while to elaborate upon it. Demonstration to the salesman means showing his goods to the best advantage to the prospect. A few years ago, this method was not employed, but now the successful salesman cannot make progress without it. Generally speaking, the better the demonstrations, the better the sales for both kinds of workers.

In the case of our agricultural specialists, we rely mainly upon the demonstration to sell our idea. There is no other method so valuable or practical. The farmer learns to prune a tree by pruning under the direction of the specialist in horticulture. He learns how to destroy the grasshoppers by mixing and sowing the poison bran mash as demonstrated by the specialist in entomology, and so it is through the entire list of projects undertaken.

Salesmen of goods who go home and report that they have closed a sale, but who on cross-examination admit that the prospect did not sign the or-

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Breaking Hollandale muck soil with a 10-ton tractor hooked to two 26-inch plows that turn a furrow 10 inches deep and bury the heavy growth of wild rice and other swamp plants.

From Cattails *to* FERTILE FARMS

By Guy A. Peterson

LESS than 10 years ago the tract of land now known as the Hollandale district in Freeborn county, Minnesota, was a swampy, frog-populated wilderness of bullrushes, flags, wild rice, and cattails. Today more than 400 farm families are living on the drained bed of the ancient lake, and the sounds that go along with intensive agriculture have replaced the croaking notes of the bullfrog.

It was at the suggestion of Dr. F. J. Alway, head of the soils department of the Minnesota College of Agriculture, and of R. S. McIntosh, secretary of the Minnesota Horticultural Society, that we drove down to Hollandale to see this reclaimed lake bed that has come to be one of the most intensively cultivated areas in the Middle West. The story of its development is indeed dramatic,

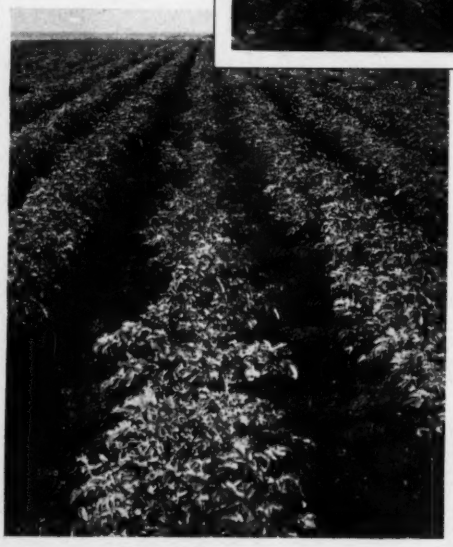
for the change from a worthless swamp to a prosperous farming community was very rapid. It took a great deal of money to develop the project, but thanks to the financial genius of the Land Colonizer George H. Payne, the funds were raised, and countless generations of farmers will harvest crops from these 15,000 acres of land that have produced nothing but swamp vegetation through all these years.

It was back in 1918 that Mr. Payne's attention first was attracted to this marsh, and together with Colonel T. F. Stroud, a man of wide experience in developing swamp lands, he made a careful examination of the tract. They crossed these fertile fields in a boat when they were still covered with water and landed on Maple Island, now peopled with more than 70 farm families who dwell in the shade of its beautiful trees and work in the level fields that surround this circular spot of high land. This island colony is patterned somewhat after the European "villa" type of land colonies in that the farmers live close together and drive out to their fields from the village. Most of their farms touch the island,

ABOVE: This field of Southport White Globe onions yielded 784 bushels to the acre on muck land treated with 1,000 pounds of 0-14-14 fertilizer.

LEFT: A mellow muck soil treated with 650 pounds per acre of 0-14-14 fertilizer produced this beautiful crop of carrots for C. Kraay.

BELOW: This field of Hollandale potatoes was treated with 650 pounds of 0-9-27 fertilizer per acre and rogued seven times, but it produced nearly 400 bushels of high quality certified seed per acre and returned a nice profit to its owner.



however, and none of them are far distant, for the average size of a farm in the entire tract is only 23 acres.

After Payne and Stroud were convinced of the possibility of developing the section into a market garden system of farming, the next important step was to drain the land. Something already had been done along this line back in 1907 when J. W. Dappert of Taylorville, Illinois, planned a ditch to carry the water which Turtle creek has disposed of formerly by nature's method. This creek was a small, winding stream which for ages had taken the overflow waters from Geneva and Rice lakes. Due to the opposition of the day, however, Dappert's first ditch as designed was never completed, but it removed much of the surface water and transformed these lakes into a marsh.

LEFT: Mr. and Mrs. Henry Voss and their son John with a 40-pound dozen of crisp, white celery that was grown on sub-irrigated muck land that was treated with 1,000 pounds of 0-9-27 fertilizer to the acre.

RIGHT: Portion of Henry Voss's celery ranch showing rows that are boarded up and bleaching. Voss put 5,000 pounds of 0-9-27 fertilizer on this five-acre field last spring (1,000 lbs. per acre).

It was upon the site of this first ditch that Colonel Dappert, assisted by Ray N. Towl of Omaha, Nebraska, and J. H. Severson of Albert Lea, Minnesota, laid a new one in 1920 that was nearly four times as large as the original. Known as the Judicial Number Four, this ditch is 100 feet wide in places and has its outlet in the Cedar river just south of Austin. It is large enough to handle all the drainage water.

A caterpillar type of ditcher that would travel through the eight or ten-inch deep water was then put to work. Nearly 150 miles of ditches were made with this machine, one on each quarter-mile line and connecting with the main outlet. They were made 12 feet wide at the top and seven feet deep, but as they lowered the water table in the land, large main tiles 16 to 24 inches in diameter were put in the bottom and covered up so the ditches could be cultivated. Lateral tile drains every 200 feet were then connected with these mains to provide a perfect system of drainage. After the ditches were filled and the tiles covered, the spoil banks were leveled down to become the basis for the roads which followed.

There are now on the tract more than 50 miles of graveled roads which were built at an average cost of $7,000 a mile, but the farmsteads are so situated in relation to them that every farmer has an all-weather highway to his door. Since the completion of the Hollandale branches of the Union Pacific and Rock Island railroads in September, 1926, the average haul to a loading depot has

been reduced to less than two miles. In passing we might add that even the railroads were laid as a result of the generalship of Mr. Payne, for it was he who secured the permit from the Inter-state Commerce Commission for the two transportation companies to lay tracks into the district. Before the completion of these roads, the vegetables were hauled to Clarke's Grove for shipping at an estimated annual cost of more than $100,000. The saving in freight charges from the fields to the loading platform will be enormous by thus reducing the average haul from seven to less than two miles.

Two Years to Drain

It took two years for the water to drain out, but as soon as it got dry enough to work, the land was broken with big 10-ton tractors hauling two 26-inch plows that turned furrows 10 inches deep. The plows were followed by 3,600-pound concrete rollers that firmed the loose, peaty soil so as to hasten the decay of the heavy growth of vegetation that had been turned under and re-establish capillary attraction. All through the first summer, tractors hauling 32-feet sections of disc pulverizers and harrows put the soil into prime condition for cultivation, so the land was in a fine tilth before it ever came into the hands of the actual settlers. What a contrast when compared with the colonization of the timbered and cut-over lands that so many pioneer settlers conquered!

An especial appeal was made for settlers of Dutch descent because in many respects the land had a resemblance to that of the dyke-protected lowland country in Europe and because only intensive farming could pay for this land that had been wrested from the water at such great expense. An American Reformed Church was organized in the spring of 1922 when three families met at the farm home of Peter Louters and listened to a sermon by Mrs. J. H. Neyenhuis, who with her family had just moved to the district from Alton, Iowa. There were twenty-two present at this meeting and it constituted 100 per cent. attendance of the members of that denomination then living there. The growth of this congregation has been phenomenal when compared with rural congregations in the United States, for there were 76 families on the role last summer when a beautiful $28,000 church edifice capable of seating 536 people was dedicated. The large size of the families is indicated by the fact that the communicant members of the church numbered 175 while there were 225 baptized children members. We mention the church in this article because it has been so large a factor in calling many of the best farmers to the tract. This congregation, however, has not been the only one that has grown, as many families other than Dutch came in, and there are several other thriving denominational units.

The farms are sold on the basis of a tenth payment down and the balance in 20 annual installments. To insure that these later payments will be met, the company furnishes free the services of two agricultural experts. These two men act in much the same capacity as county agricultural agents, for they are called upon to do all kinds of work in connection with the management of these farms. Many of the settlers are corn belt farmers who have had no previous experience with truck crops.

The five main staples grown here are potatoes, onions, cabbage, carrots, and celery with considerably more than half of the cultivated land devoted to potato culture. Paul N. Davis helps the farmers with their potato problems while C. W. Blocker gives especial attention to the production and marketing of the other four crops. As managers of the Hollandale Marketing Association, Davis and Blocker not only keep the wires

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A fruit experiment station is maintained in Hood River Valley.

OREGON

Experiment Station

By F. L. Ballard

County Agent Leader, Corvallis, Oregon

"IN a state institution of higher learning the student should be inoculated with the idea of making a definite contribution to the commonwealth. His education is not of highest value to him if it has taught him only how to get something out of his environment and not how to give something back to it. The aim of the Oregon Agricultural College has been to build up an organization for service to Oregon, its natural resources, its industries, and its homes."

These words of President W. J. Kerr indicate the ideal that has held dominance in the remarkable development of the Oregon State Agricultural College throughout the past 20 years. In resident instruction, in the experiment station, in the extension service, close contact with people of the commonwealth has obtained and the program of the entire organization has been cast because of the sympa-

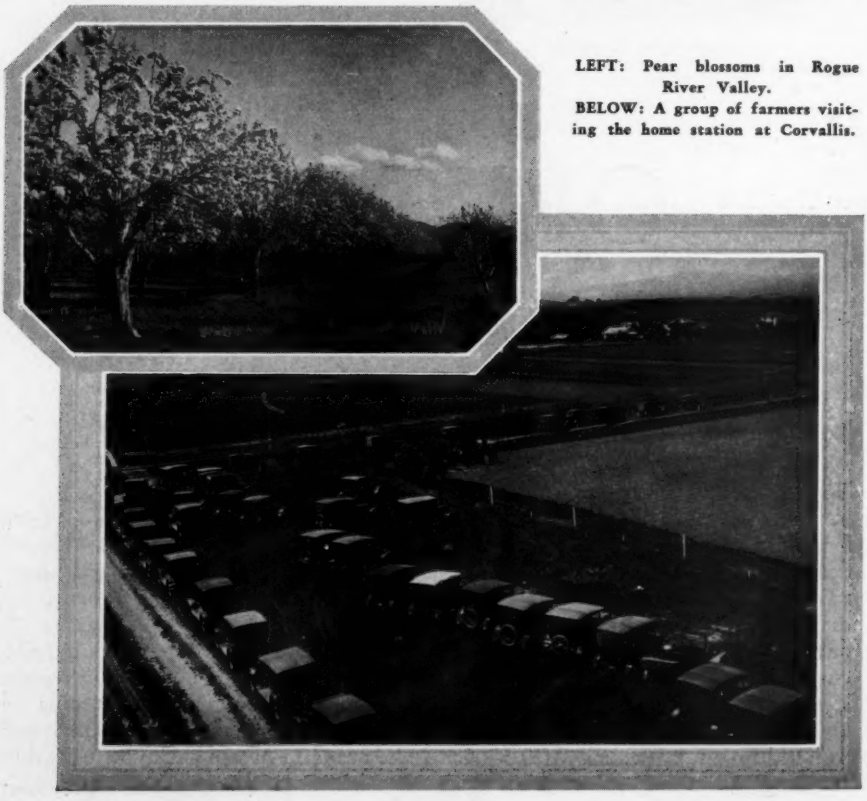
thetic appreciation resulting from such contacts, along lines of most practical service. "Science for Service," and "College and State" have been at different times titles of publications of the institution which sharply focussed thought upon its trends.

Only such ideals, supported through years by progressive fulfillments, could build an institution like the Oregon State Agricultural College in a state so sparsely populated and of such modest wealth. Standing second or third year after year in student enrollment among the institutions of its kind in the entire United States, is a mark of distinction in a state of less than a million population and only a billion dollars assessed valuation.

Activated by the will to render most vital service to the relatively new and rapidly changing agricultural conditions common to the far western territory, it is perhaps not surprising to learn that one of the first great contributions to agricultural science on the part of the Oregon Experiment Station was one which virtually saved an important phase of the agricultural industry of the state. In addition, it revolutionized orchard spraying in all parts of the world. This accomplishment was the discovery that lime sulphur would control apple scab, which, as early as 1903, was threatening the entire apple industry of the Northwest.

Washed Fruit Superior

Again in the field of horticulture, the Oregon Experiment Station officials showed their alertness in the matter of the recent crises resulting from legal restrictions on the quantity of spray residue permissible on fruit, both



LEFT: Pear blossoms in Rogue River Valley.
BELOW: A group of farmers visiting the home station at Corvallis.

ABOVE: One of the experiment station fields. LEFT: Central group of buildings of the School of Agriculture.

for foreign and domestic trade channels.

The tolerance limit was so low that ordinary wiping processes were ineffective, and the extensive fruit industry of the Northwest faced overwhelming losses. No sooner had the development surrounding the problem taken shape than the Oregon Experiment Station was busy with trials of weak solutions of chemicals. In a few months it was found that by the use of very dilute hydrochloric acid, spray residues could be removed. Other solvents were also found effective. Further tests, however, showed that the weak hydrochloric acid had no deleterious effect on the keeping qualities of the apples and pears, under normal conditions. Another step was the collaboration with two equipment concerns in developing simple washing machines suitable for use on any farm for the needs of individual growers. Word now comes from the markets that the washed fruit is so superior in appearance that some advantage in price may well be expected for it.

A dozen years ago the Oregon Station found that the three leading commercial sweet cherries of the state are not only self-sterile, but inter-sterile, as well. This discovery resulted from careful orchard studies made in response to urgent appeals from large numbers of cherry growers whose extensive plantings were not producing commercial crops. Extensive trials in the immediately succeeding years brought out a fairly complete catalogue of fertility coefficients between cherry varieties. Not only did it determine which varieties must be transplanted or grafted in to insure fertility, but also particular trees of particular varieties were identified as superior pollinators, and from these cion wood for innumerable orchards was selected.

Proper Pear Picking

Twenty years ago this fall the first carload of Bosc pears was shipped from Oregon. Fifteen hundred to two thousand cars are now the crop, and the volume is increasing. Blight, the

scourge of pear growing everywhere, has been held in check by the Oregon Experiment Station. Cutting methods, disinfection, and spraying have been found effective in blight control. Great interest attaches to the studies of the station on blight resistant stocks. An investigator was sent to China where for months he travelled the interior regions, collecting native stocks, which are now being developed and tested on the branch experiment station at Talent in the Rogue River valley.

Affecting the pear industry, also, and of immense practical value, is the pressure-testing apparatus devised a few years ago to determine the proper picking time of pears. About 90 per cent of the pear tonnage of the state now has the picking date determined by this instrument, and 10 to 20 per cent increased tonnage is obtained by picking at the right period. It also is being developed now for use on apples and plums. These accomplishments are typical of a large list of projects accomplished and being accomplished for the horticultural industry of the state, which, at current valuations, involves an investment of $60,000,000 and an annual crop of $16,000,000 to $20,000,000.

Field crops are, of course, the state's major agricultural wealth-producing group. Of these, wheat is the headliner, with an annual farm value of $19,000,000 to $35,000,000. No attempt will be made in this limited space even to name the determinations of the Oregon Station that have affected field crop production.

For an example, let's touch the field of wheat production. Instead of 63 commercial varieties as 10 years ago, 11 are now considered the standard in the state, the inferior ones having been replaced by higher yielding ones and those more sought on the markets. This program carried on, together with a seed certification system in cooperation with the extension service, resulted in a decline of mixed wheat on the Portland market of from 33 1-3 per cent to 8 2-5 per cent in seven years.

In wheat production, also, the adoption and dissemination of the Federation wheats have had marked influence on the wheat production of the state. The Federation wheats are normally spring wheats. They were selected and recommended to farmers after years of painstaking work with a collection of commercial wheats of the world. Small lots of seed were distributed to farmers in 1921. They demonstrated the superior yielding quality claimed by the station. By 1924 they were planted on about 76,000 acres and yielded an average of two to five bushels more than spring wheats commonly grown. The gain from these varieties was estimated in value at about $300,000. Winter wheats, however, are grown mainly in eastern Oregon. A large acreage was killed by frost during the winter of 1924-25. Farmers followed the advice of the station and reseeded about 400,000 acres to Federation, paying a premium for the seed. It made an increase in yield of two to ten bushels an acre over commonly grown varieties. Farmers' estimates of the increase were larger generally than those of the station.

Two Million Bushels

For the 400,000 acres grown, the increase was estimated at one and one-half to two million bushels, with a market value of over $2,000,000. Farmers paid the loans advanced by the state for seed and announced that Federation wheat and the Moro Experiment Station were due a large share of credit. Federation and Hard Federation have become the main commercial spring wheats in eastern Oregon. They are proving of value in southern and central Oregon, and in other states.

Investigations are going on with some 6,000 varieties, strains, and selec-

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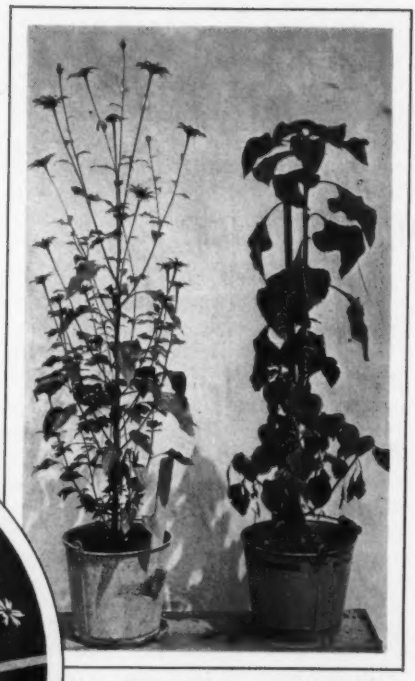
Telling Plants When *to* Flower *and* Fruit

By LEWIS E. THEISS
Bucknell University, Lewisburg, Pennsylvania



ABOVE: Tithonia, a semi-tropical species which cannot flower in our latitude because cold weather arrives before the days become short enough. These plants were photographed in July with the plant at left receiving ten hours of light daily.
LEFT: Wild aster forced into flower in June by exposure to short day.

HOW would you like to have chrysanthemums abloom in July or iris flowering at Christmas time, or spinach that produces a constant crop of edible foliage throughout the summer instead of going to seed when the hot days come? How would you like to have lettuce that remains nicely headed in August instead of shooting up a flower stalk and becoming worthless for table use? Would it be worth anything to you, as a home gardener, or a commercial trucker, or a professional florist, to have any of these things?

You can have any or all of them, as well as many other equally attractive "abnormalities" if you wish to take a little trouble. For Uncle Sam, through experiments made by the Bureau of Plant Industry, has discovered what makes plants flower and bear fruit, and he has also discovered how to control the time of flowering and fruition.

For uncounted centuries man was content to watch the iris bloom in June and the witch-hazel flower in November, and never ask why. But W. W. Garner and H. A. Allard, of

the Bureau of Plant Industry, began to inquire into the reasons for a plant's blooming at precisely the same period each year.

Up to the time of their investigations, it had been assumed that plant action was due largely or wholly to heat; that when it was warm enough, plants started to grow; and later, when it was hot enough or cool enough, they flowered. But these keen inquirers soon found that many plants, like the iris for instance, could be placed in a hothouse in winter, at midsummer temperature, and yet refuse to bloom. And the cosmos, which flowers so late in the year that it was believed its blooming was dependent upon the coolness of autumn, altogether refused to blossom in summer, even if placed in a temperature like that of fall. So it was evident that something more than the warmth of the air controls the flowering of plants.

Atmospheric Changes

Atmospheric changes are but one of the seasonal changes that occur with pronounced regularity year after year. The daylight itself varies regularly month after month in its intensity. So our two investigators turned their attention to the behavior of the sunlight.

In midsummer, when the path of the sun across the sky is at its highest, the total intensity of the light at Washington to which their plants were exposed might reach 10,000 foot-candles in the middle of the day, whereas in winter the midday light intensity is scarcely half as great. So an experiment was arranged to test the effect upon plants of different intensities of light.

Specially constructed shades of cloth were used to screen a planting of soybeans from the direct rays of the sun. Cotton netting of five different weaves was employed. The reduction in the intensity of the direct sunlight at noon ranged from 30 per cent of the total for the most open meshed cloth to more than 65 per cent of the total for the closer woven netting. Though the soybeans were affected in other particulars by the shade, the date of their blossoming, as compared with that of plants grown without any shade whatever, was neither advanced nor delayed a single day. Likewise other experiments showed that Mammoth tobacco was not affected by shading so far as concerns the date of flowering.

It thus became evident that neither heat nor light intensity advanced or retarded the flowering of plants. So the investigators turned to the matter of relative length of day and night. For just as atmospheric heat alters with the change of seasons, and the intensity of the sun's light increases and decreases, so the length of day regularly waxes and wanes as the year advances. The question now was to discover if the changing length of the daylight period had any effect on flowering and fruition.

To this end a darkhouse was built, so constructed that air could enter and flow out without admitting light. Tracks were built in this house, and small trucks used to hold the different plant boxes. These could be rolled in and out at will, and thus the daily period of light could be regulated as the experimenters wished.

Many Varieties Tested

Many varieties of plants were tested. The action of the Biloxi soybean was typical of many of the plant reactions. The Biloxi normally blooms in late fall, when the days are short. By limiting the daylight period to 12 hours instead of permitting the normal 15 hours, the experimenters made the Biloxi bean, planted in May, bloom within four weeks of the date of germination. Control plants in the open, that received the full amount of daylight, did not blossom until September, or four months after germination. Of course the plants that bloomed in four weeks were very

RIGHT: Biloxi soybeans which were photographed on September 13th. The plant on the right having been exposed to a ten-hour day, began flowering July 19th and bore ripe seed when photographed. The plant on the left, exposed to natural day length, began flowering on September 11th. BELOW: Klondike Cosmos (Oct. or Nov.) is easily forced into flowering by exposure to short days (10 to 12 hours).

much smaller than those that grew four months before blooming.

This and similar experiments showed that there is a class of plants, now termed "short day" plants, which blossom only when the days are short. Other tests showed that another class of plants, like the iris, flower only when the days are long. And still further tests, made by supplementing the natural light with artificial light, showed that plants of these classes cannot bloom at all unless the period of daily light is approximately what they need. That is, a plant needing 15 hours of daylight to bloom, cannot blossom if the light is limited to 10 hours daily; whereas a plant needing 10 hours of light to bloom, cannot flower if the light is extended to 15 hours daily. And even a relatively weak electric light, used to supplement the daylight, was effective in preventing flowering or in producing it, as the case might be.

The converse of this is just as true. By artificially producing the proper period of light, the gardener can force any plant to bloom prematurely or out of season, as the iris in midwinter, and the witch-hazel in midsummer. If the summer day is shortened to 10 hours in the lettuce bed, the lettuce will go on developing vegetatively, and make fine, big heads, but it cannot send up a flower stalk and bloom.

Some plants seem to be "middle-of-the-roaders." They have a long period of bloom and will flower whether the day is long or short. But in general, most plants are either "long day" or "short day" plants. Their flowering can be artificially controlled.

The wide-awake plant grower sees at once the immediate and the future bearing of these epoch making discoveries. For instance, the florist who wants to get big money for novelties, can easily force chrysanthemums or other late fall flowers into bloom in summer. In winter he can have on sale summer flowers, like the iris, that hitherto it has been impossible to produce in winter.

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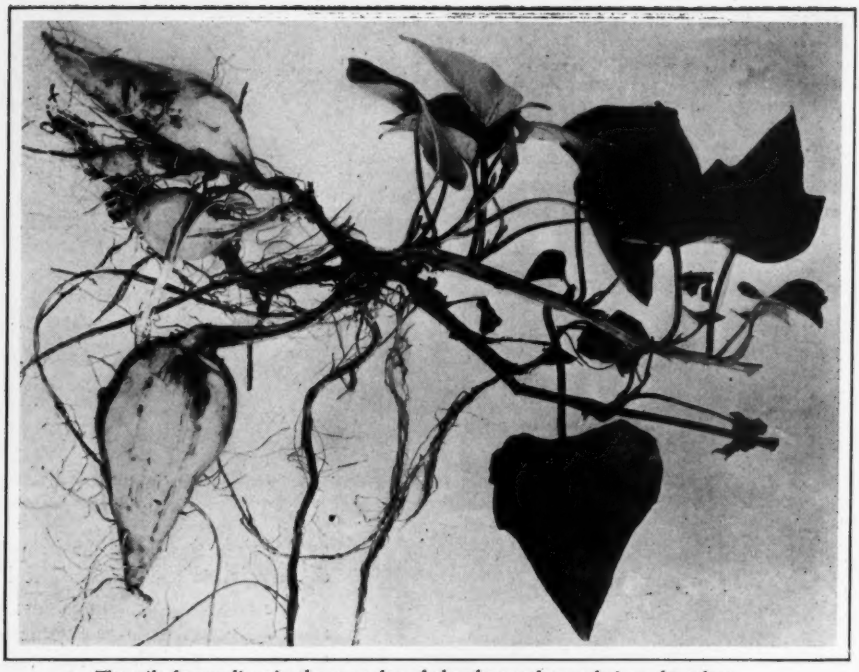

The wilt fungus lives in the sap tubes of the plant and spreads into the tubers.

Sweet Potato Wilt

By C. T. Gregory
Purdue Agricultural Experiment Station

LAST spring at Vincennes, Indiana, there was a meeting of 175 of the sweet potato growers of Knox, Gibson, Sullivan, Daviess, and Pike counties. These growers were up in arms about the sweet potato wilt disease. This meeting was called to discuss ways and means of fighting the pest. They decided to strike their blow at the source of the trouble, the disease carried in the seed, by field inspection and certification.

In each community a committee was appointed to take charge of the local work. To this committee any grower could report a field that he considered free from wilt and which he wished to have inspected. This information hastened the work of inspection and did away with much useless traveling.

In August, the first inspection was made by a Purdue plant pathologist. At this time the first evidences of the disease were showing. Any plant having yellow leaves was examined. The branch bearing the yellow leaves was located and the skin of the stem was torn back with the thumb nail. If the sap tubes were black, this vine was carefully traced back to the hill and the entire hill was dug out. It would have been dangerous to leave any of these potatoes in the hill because they might later have been dug and used as seed. Needless to say, if the field showed more than one or two per cent of such plants it was

discarded immediately as a possible candidate for certification.

The owners of the fields passed in this August inspection all agreed to work over the field and dig out all diseased plants. They used the yellow leaves and the blackened sap tubes as their basis of judgment.

In October, a second inspection of the fields passed in August was made. There was no attempt made to dig the diseased hills at that time. It is not safe to use seed from a field that cannot maintain itself free from infection after all the diseased plants were rogued out in summer. It is evident that such fields had diseased soil, and sweet potatoes from diseased soil are unsafe so far as seed purposes are concerned. From 34 growers asking for inspection, 12 fields were passed.

The value of wilt-free seed was well illustrated this year in the fields belonging to the sweet potato club boys. The plants furnished these boys were obtained from Frank Plass, a sweet-potato grower at Decker, Indiana. This seed came from a field which was examined in the autumn of 1926, and was found to be almost entirely free from diseased plants. Twenty-three quarter acre club fields were inspected. Fourteen of them were passed as suitable for seed purposes. In no case was there as much as one-quarter of one per cent. of disease, but at the time of the second inspection the field must be free from the disease to be considered safe for seed purposes. In none of the fields

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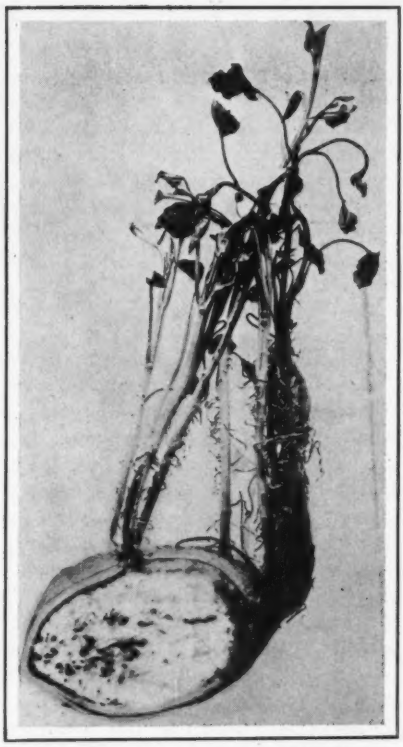
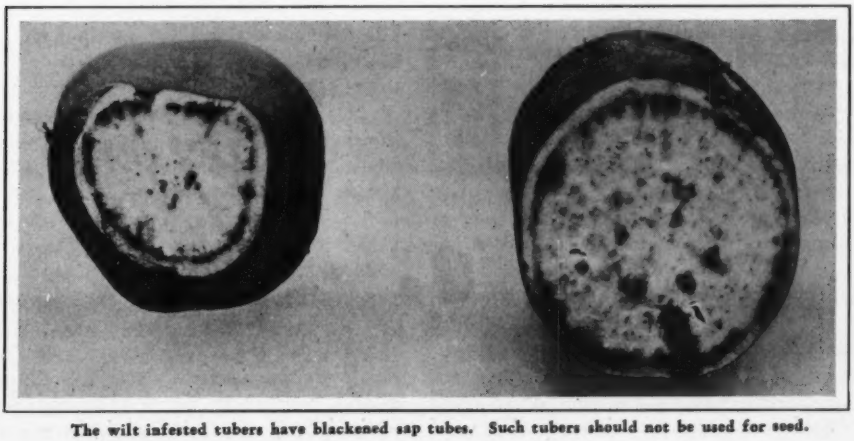


From the diseased potato the fungus spreads into the new sprouts ready to be carried to the field.



The wilt infested tubers have blackened sap tubes. Such tubers should not be used for seed.

Making Farm Credit Easy

¶ How the Intermediate Credit Banks are helping the farmer

By Edwy B. Reid

CREDIT for the farmers has formed an important part of every farm relief plan offered in Congress for the last several years. Proposals ranging from almost certain loss, on the part of the prodigal Government agency designated to disburse the funds, to safe, sane, and conservative aid, where aid is not now available, have occupied much of the attention of the solons and the public. The credit squeeze of 1920, with the steady application of the pinchers for several years following in some localities, is still a vivid picture in the minds of many a farmer. His pocketbook nerve is still emitting twinges of pain when too much pressure is exerted upon it.

Out of the credit squeeze came a law—the Intermediate Credit Act—which created 12 banks, the capital of which is owned by the Government and the money to loan obtained through the sale of short-term bonds, which were created for the specific purpose of avoiding the repetition of the catastrophe which was forced upon so many farmers about half a decade ago. It is a system of credit based upon agricultural collateral which advances money for more than six months and up to, in the case of breeding herds, three years.

What has happened? Have the farmers made use of these new banks as was anticipated? Has there been sufficient stringency to cause the regular commercial banks to rediscount farmers' paper? Do the banks stand ready to prevent the repetition of such a squeeze as is still painfully remembered by many a farmer?

The ability of the Intermediate Credit Banks to function depends upon two things: (1) cooperatives who are willing and able to borrow from them, and (2) agencies which can and will rediscount their agricultural paper with them. These 12 banks established in 1923 have done a large business, taking the country as a whole, both in direct loans to farmers' cooperatives and indirect loans to agricultural credit corporations, livestock loan companies, and other lending institutions. Three hundred fifty million dollars, lent to farmers' cooperative associations with memberships aggregating approximately a million farmers and rediscounts from 557 agencies approximating $118,000,000, is not a small stroke of business to do for agriculture, considering the fact that the banks are now only about four years old and that they had to be set up and pioneered in a field—loans running for more than six months and up to three years in the case of breeding herds. The banks are so constituted as to be capable of serving agriculture with loans up to $660,000,000. Thus their resources have been taxed to only a minor extent.

It was the intention of some of those who worked for the passage of the Intermediate Credit Act that the system should function more as an emergency system than one which would constantly serve the needs of agriculture; others believed there was

need for Intermediate Credit of this character constantly and that the demands on these banks would and should grow from year to year. They have increased annually. The question is how great will they grow and how great is their need. It is impossible, of course, for them to lend beyond the letter and spirit of the Act. When they were established there were no agricultural credit corporations and now there are more than 300 functioning in various parts of the country, mostly in areas where banking conditions have not been favorable to farm loans or, to put it another way, where regular commercial banks have closed their doors in large numbers. Others have been set up because of the sheer necessity for additional funds for lending on cattle, sheep, dairy cattle, and for agricultural production purposes.

The Act made no provision for financing the organization of agricultural credit corporations. They have been started in several ways: farmers have subscribed to stock, business men have subscribed, and banks have started them as adjuncts to their own banking operations. Cooperative marketing associations have found that in addition to credit on their warehoused commodities, it was necessary and desirable to finance their members during the production season. Possibly the greatest single need of the system is more agencies which will lend to the farmer in the first instance and rediscount the paper with the Intermediate Credit Banks. This business is already growing at a rather rapid rate. The livestock loan agencies have found the Intermediate Credit Banks particularly adapted to their needs. For instance, the vice-president of the Intermediate Credit Bank at Berkeley, California, having handled sixteen and a half million dollars' worth of cattle paper, says:

"The Intermediate Credit Banks tend to stabilize the financing of livestock on a basis which assures continuity and reasonable cost. Advancing funds on livestock as collateral is a type of financing which properly belongs, generally speaking, to livestock loan companies rather than to commercial banks with deposit liabilities. Such loan companies, which formerly had to market their paper with commercial banks before the establishment of the Intermediate Credit Banks, have stated that they would go out of business rather than return to the old method of finding an outlet for their paper with commercial banking institutions which, when depression comes, find it necessary too often to call the loan and thereby bring upon the unfortunate stockman, in many instances, enforced liquidation such as occurred too frequently during the post-war period of deflation beginning in 1921."

Wonder is sometimes expressed that the ordinary, orthodox commercial banks do not rediscount their paper with the Intermediate Credit Banks, thus being able to extend their loans to farmers much more freely and in greater amounts than at present. Only about nine national banks and two savings banks and 139 state banks to date have utilized these facilities. One of the chief reasons is the fact that the amount which they charge for the money so loaned is limited. For instance, if they rediscount farmers' notes with the Intermediate Credit Bank they pay the bank 4¾ per cent. If these loans are ordinary agricultural loans they can charge the borrower only 6¾ per cent. If these notes represent loans on livestock, they are limited to an additional charge of 2½ per cent or a total of 7¼ per cent. This includes all expenses in connection with inspection, handling of papers, etc. If the bank is charging a higher rate of interest for its own money, it naturally does not wish to be required to make loans for a lower rate.

In addition there is the question of two interest rates, provided they have a higher or lower rate on their money. This seems to be very ob-

jectionable from the standpoint of the local banker.

Further, there is the same objection which applies in the minds of many country bankers to the utilization of the Federal Reserve system. They are timid about publishing any statement of the finances of their banks which shows that they borrow from any other institution. They fear that their competitors or somebody will start talking around the town and throughout the rural communities that the bank is in such shape that it had to borrow money from other institutions in order to "get by." Such feeling on the part of country bankers may or may not be commendable or good business. It is there just the same.

Then, too, there is the matter of the length of time for which the loan must run, the law prohibiting the Intermediate Credit Banks from rediscounting any paper which at the time of rediscounting has a maturity of less than six months. The commercial banks frequently do not make loans for more than six months on agricultural paper including livestock paper, therefore, they are not accustomed to the longer period.

There has been some mortality among agricultural credit corporations, particularly those having a small capital and, therefore, a high overhead in proportion to the amount of money they can lend. However, the majority have now been in operation nearly two or three years and have been able at least to break even and acquire some experience, some of them of course making a little money. Some of these corporations were set up in the first place more as eleemosynary institutions than as credit companies to do business for profit, consequently the purpose for which they were organized has been served.

The question naturally arises, if some parts of the country can organize, operate, and maintain 30 or 40 credit corporations to a state, why can not others? There is nothing in the Intermediate Credit Act which prohibits organization or which makes organization or operation in one state more favorable than in another. For instance, we find the South going strong in the matter of agricultural credit corporations, the Columbia bank district covering the Carolinas, Georgia, and Florida having 47. In the St. Paul district serving Wisconsin, North Dakota, Michigan, and Minnesota there are 124. In the Omaha district covering Iowa, Wyoming, South Dakota, and Nebraska, 50 associations have been served, while in the Wichita district the number is 37. Spokane has a fair start with 11. This refers to agricultural credit corporations. They lend on livestock the same as do livestock companies, but many of them also make general agricultural loans using all sorts of agricultural commodities as chattels. In addition, 13 livestock loan companies have used the Wichita Bank, 24 the Houston Bank, 5 Berkeley, and 7 the Spokane institution.

The Intermediate Credit Act, of course, did not contemplate that the Federal Farm Loan Board or Intermediate Credit Banks would organize the farmers into cooperative marketing associations in order to lend them funds on their warehoused commodities. The managers of these banks, however, have given very sympathetic aid and assistance to farmers wherever opportunity afforded. They could not go beyond the word and spirit of the Act in lending upon warehoused commodities. If the Act is not broad enough, it is the province of Congress to amend it.

However, in the last four years the Intermediate Credit Banks have lent on a long list of farm products, which include: wheat, cotton, wool, tobacco, raisins, peanuts, broomcorn, beans, rice, alfalfa and red top seeds, hay, nuts, canned fruits and vegetables, maple sirup, strained honey, dried fruits, coffee, olives, and olive oil. The list is growing as the re-

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Cutting Cotton Costs

By A. B. Genung

U. S. Department of Agriculture

DURING eight of the last eleven years the price of cotton has been relatively higher than the wages, fertilizer, or land which comprise the chief items in its cost of production.

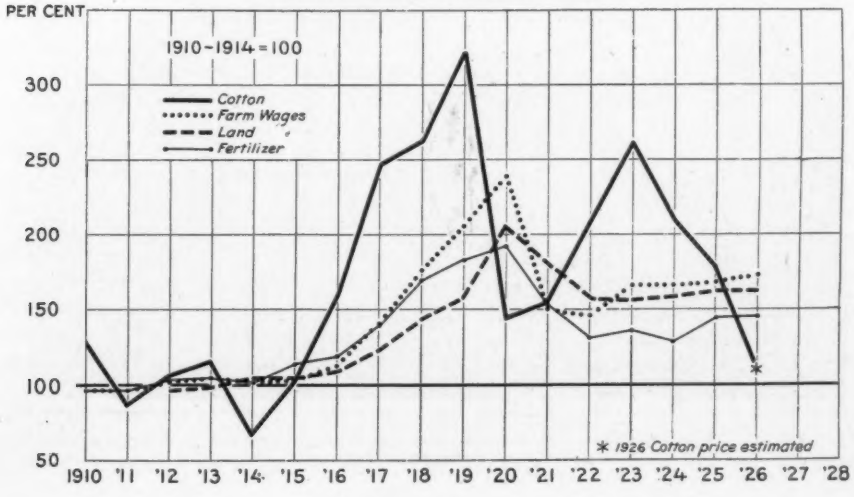
Ever since the sharp price slump of last fall we have been thinking of cotton as a needy subject for "farm relief." But the fact is that cotton has been a relatively prosperous part of the picture for quite a while. Last fall and its 11-cent cotton have not been the rule, by any means, in recent times. During seven of the past ten years the average price of cotton—the price received by growers in the fall of the year when they are selling cotton—has been above 22 cents a pound. Almost 14 billion dollars' worth of cotton sold in the ten years prior to last season by the farmers of the South! That included 1921, too, which was a very lean year. It wasn't just an accident that the Cotton Belt grew a big crop last year. It hasn't been just by accident that cotton acreage has increased from 30 million to 48 million acres within five years. The South had a genuine background of prosperity against which to cast last season's darker picture.

During the last ten years the wage of hired labor has been relatively the highest item of cost entering into cotton production. The wage level is now generally the high cost in agricultural production.

This high wage level involves a story in itself. It is an old story of events characteristic of a period of financial deflation. It has happened before and it will presumably happen again if and when we get our price level up on another peak of inflation and then have

INDEX NUMBERS OF PRICE OF COTTON AND FACTORS USED IN PRODUCING COTTON

Cotton Growing States, 1910-1926



to go through the morning-after of deflation.

During either inflation or deflation wages always lag somewhat behind the general price level.

On the way up the mass of workers raise a hue and cry about the high cost of living, meaning chiefly the high cost of food. Their income is lagging behind the procession. Farmers then are prosperous and land values advancing.

On the way down, the wage earner is in the advantageous position for his earnings do not go down as fast as the generous price level. Then the "holler" comes from the farmers. They have to produce and exchange their products on a handicap basis.

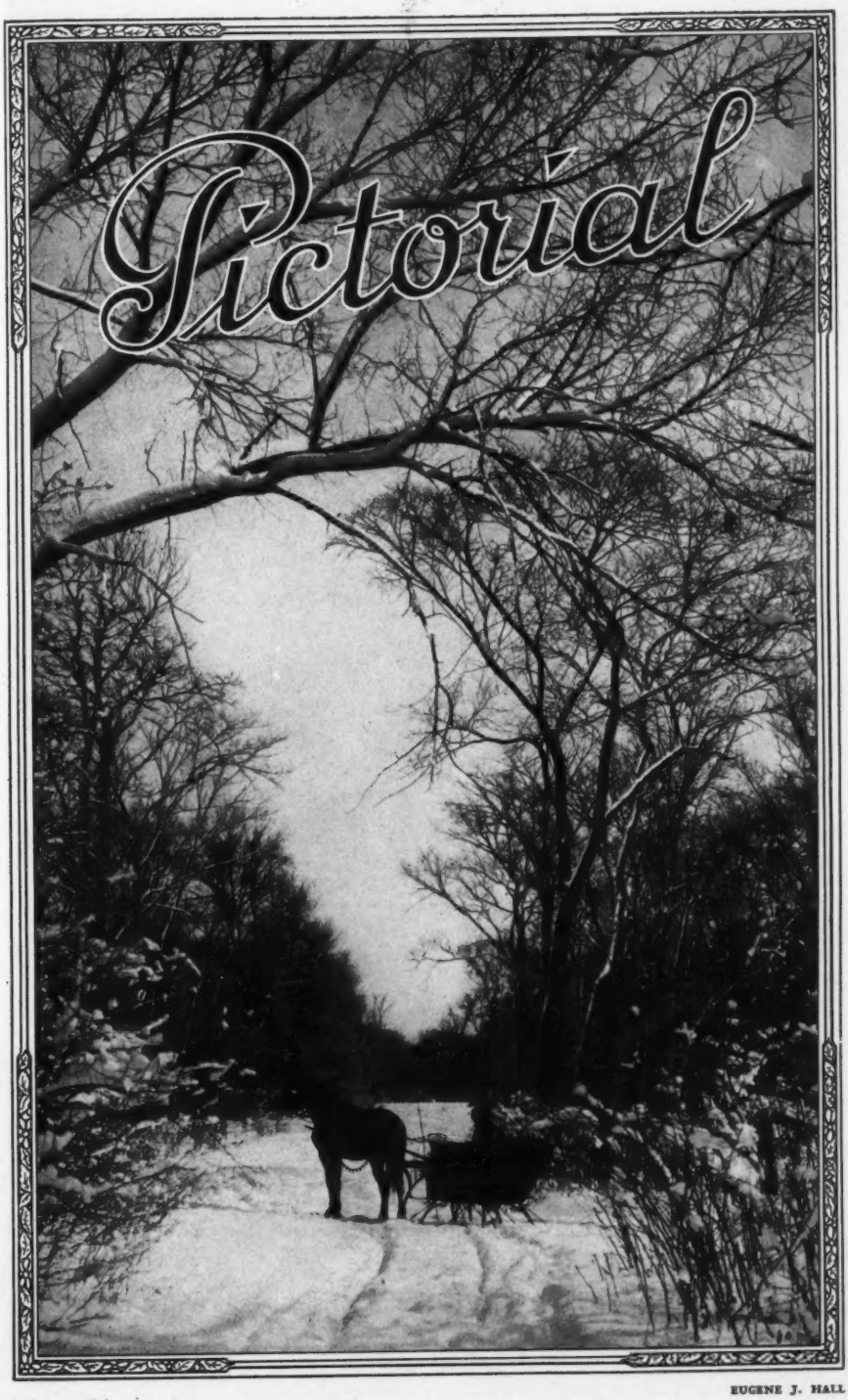
The level of farm wages is, of course, largely influenced by city wages, for in this country there is a free and constant movement of workers between country and city. If your Georgia field hand finds his wage too far out of line with that of his cousin in an automobile factory in Detroit he pulls up and goes north. So, during the deflation period the farmer has to pay relatively high wages for help, just as he has to pay high industrial wages in the shape of the high-priced manufactured article that he buys.

Land prices represent a medium somewhere between the price of the farm product and its direct costs of production. Farm land values readjust themselves, over a period of time, in some normal relationship to farm profits. But there is some lag in movement of land values just as there is in the movement of wages. So, during

(*Turn to Page 49*)

99% Perfect

Marie Antrum, of Kingman, Kansas, whose health score was 99.15 per cent and J. Fred Christensen of Blanchard, Iowa, who scored 99 per cent, in the Health Contest at the 4-H Club Congress in Chicago.

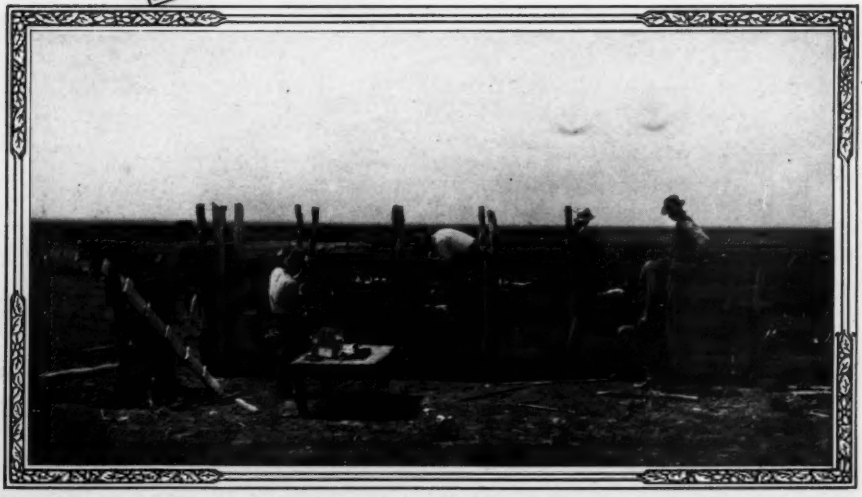


EUGENE J. HALL

RIGHT: No this is not a fair maiden held in cruel captivity. It is a movie set visited by delegates to the Soil Science Congress on their cross-country tour last summer.

International

LEFT: These cactus apples were grown on a farm near San Fernando, Cal., that specializes in their production. They are used in making preserves, jellies, and candies.



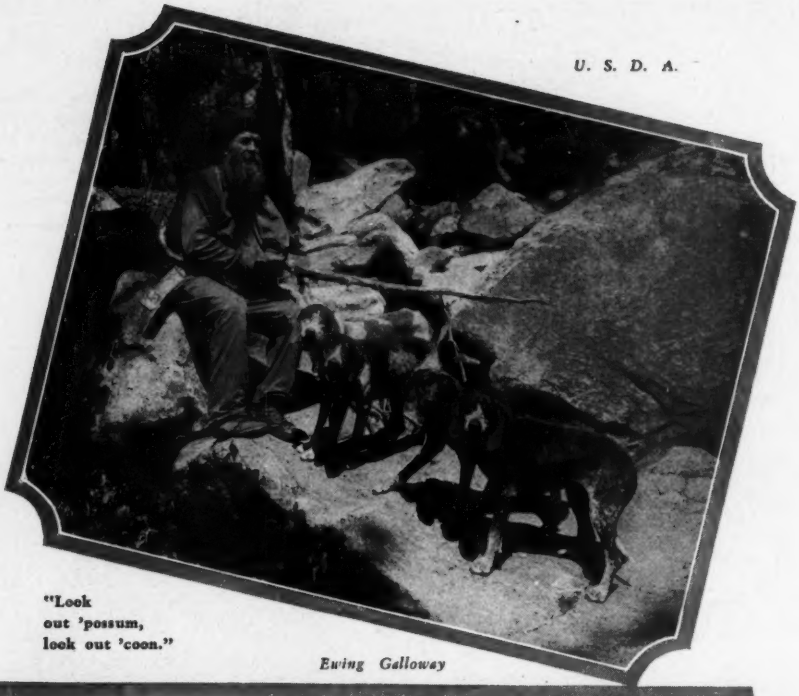
The calves in this chute are being vaccinated for blackleg as prevention against this dread disease.

LEFT: A New York musical comedy star showing that she is a true daughter of Eve. She was winner of an apple eating contest during "Apple Week" when everybody joined in to popularize the famous fruit.

RIGHT: Lou Gehrig and Babe Ruth with "Lady Ruth," world's champion laying hen. The Babe was given her 170th egg for breakfast.

These camels are "walking a mile for better crops," taking bags of fertilizer to Egyptian fields.

U. S. D. A.



"Look
out 'possum,
look out 'coon."

Ewing Galloway

An old water mill in the Ozark Mountains in Arkansas that is still in use.

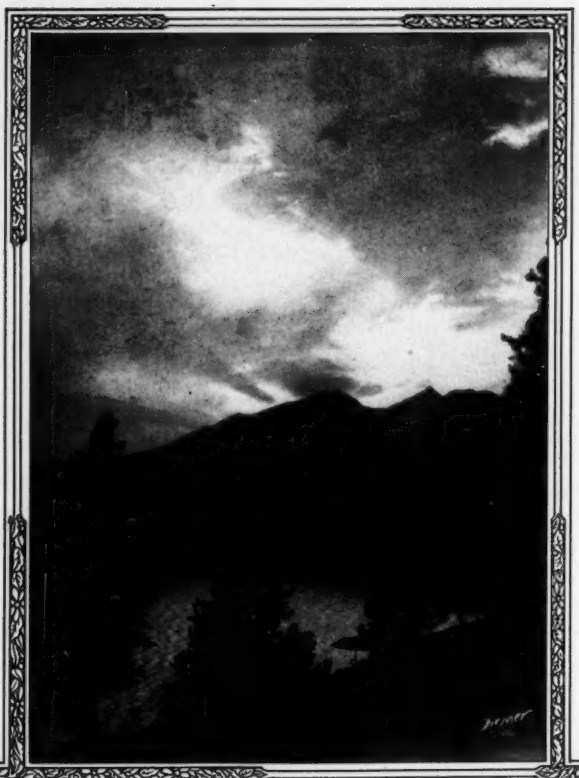
International

ABOVE: In spirit this photograph represents the winning of the West. It shows a cowboy with a team of buffaloes he uses for farm work.

RIGHT: An Indian signalling from a mountain-top, talking in his tribal language by signs with his arms, in the same manner that the sailor wigwags today.

Ewing Galloway

Cattle corralled at the end of a big round-up on a South Dakota ranch.



A sunset at Jasper Park, Alberta, in the Canadian Rockies. This was one of the points visited by delegates to the International Soil Science Congress on their cross-country tour last summer. The route included interesting points over a wide area in the United States and Canada.

Ewing Galloway

A job that winter brings—getting in a supply of ice at Cold Springs, N. Y.

The Editors Talk

In Retrospect

Prosperity is in the air and some people's bank accounts.

While most of such prosperity has been in cities and urban centers, the farmer has this year caught up a little with his city brethren. The gap is not quite so wide as it was, though a gap still exists. But that any progress towards better rural conditions has been made, is something to record to the credit of the year 1927.

The crop season started somewhat badly. A disappointing wheat harvest was predicted. The outlook was for a short corn crop—the smallest in 25 years. At one time a low production of cotton seemed probable. But a poor spring and mid-summer was followed by a better growing season in September and October. Crop yields recovered.

The wheat crop is the best in six years. Corn is yielding 100,000,000 bushels above last year—the price so far remains fairly good. Tobacco prices have dropped somewhat, but good prices still prevail in many areas. Potatoes are yielding a few million bushels over last year.

Thus a season that started badly has turned out to be a fairly good one, with total yields of the major crops not so high that prices have dropped disastrously, or yields so low that the total income has been unprofitable.

Various groups will doubtless be anxious to take credit for any improvement in crop values achieved in 1927. In the last analysis, however, most of the credit must be given to changes in the weather.

The weather in a large measure governs our agricultural operations. Disorderly production and distribution are the common causes of fluctuations causing the farmers' losses. Orderly production and distribution are badly needed. Fortunately, however, while we are discussing these problems and finding out how best to put them into effect, the weather this year has helped us along to a better farm income.

Country Children

There are 6,051,810 children under 10 years of age on farms owned and tenanted by white farmers in the United States.

Tenant farmers show a much larger proportion of young children than do owner farmers. The figures as shown by the Federal farm census conducted in 1925 are now being made public by the Bureau of Census. These figures show that out of an owner population of 16,079,708 farmers, there were 3,539,722 children under 10 years of age, while out of a

tenant population of only 8,165,537 farmers there were 2,512,088 children.

These figures represent one of our greatest assets and greatest responsibilities. Fortunately the last two decades have witnessed a definite effort to harmonize the child's training with rural surroundings. Agricultural schools have been established; boys and girls clubs organized; and many other activities started by trained leaders, calculated to give the child a sympathetic outlook of rural life and a glimpse of its true possibilities.

Every appropriation that is asked for to help these organized efforts train the country child should be strongly supported. An excellent start has been made. Thousands of rural teachers, county agents, and extension men are doing a good and faithful work for small returns—content to carry on because they believe in their work. Whatever else is done for the farmer, in the last analysis rural life will stand or fall on whether it keeps for itself the best brain power and the soundest character. These 6,000,000 children are the foundation of our rural life of the next generation and the bed-rock of our national civilization.

Any man or woman leader guiding and teaching this group is earning something vastly more than their monthly pay checks.

The Newer Business

The man on the street, and that means most of us, probably regards business as primarily trading and accumulating dollars—good business being a little of the first one and a lot of the latter.

True perhaps for the past, but the future will be vastly different. Business is changing; putting on a new dress. It is not simply trading and dollars any longer. Business is emerging as a profession. As a profession the newer type of business is facing vast responsibilities that it cannot escape. It is drawing up codes, studying ethics, defining new relationships and problems and viewpoints. The dress that fitted for so many years is fast growing too small, lacking in texture, quality, style, and fit.

What is the cause of this change? In few words—it is the effect of science. The offspring of science in the form of numberless practical applications have escaped from the laboratory and, journeying over the earth, are changing everything, material and mental.

As Wallace B. Donham, who has ably discussed this question in the Harvard Business Review, says, "The creative scientists have lost control of the consequences of their thinking." Having probed and worked in terms of "the law of gravitation, the laws of thermodynamics, the hypothesis of molecules, the atom, and later the electron," and given the results of their thought to the ordinary working world, rapid changes are being made in the environment of everybody. No one escapes the change.

As the author points out, "All the practical developments of scientific thinking, including power machinery and factories, railroads and automobiles,

the fast mail, the telegraph, and wireless have revolutionized both our intellectual and material environment within a few decades."

The business group has, therefore, found itself in control of the results of scientific thought because the business group is in control of the mechanisms of production, distribution, and finances. Inevitably the business world is faced with new problems, new possibilities, touching many phases of our civilization.

If the business group is to survive, if it is to rise to the great demands being made on it, then as never before in the history of business, it needs to generate the long-time viewpoint, to develop broadly equipped leaders, to enlarge the contacts of business itself, to specialize less in one particular field, and develop a viewpoint that sees the part in relation to the whole social structure.

"The social responsibility of the business man is inescapable."

The multiplication of socially minded business men is, therefore, the central problem of business in the present business age. To this the scientist must contribute by fearlessly following the results of his creative thinking out into the business and working world. Only by a fundamental harmony between science and business can the forces now being generated be controlled and utilized to strengthen our present civilization.

As the author very properly puts it, "Unless without great lapse of time there is this essential coordination and socialization of business, our civilization may well head for one of its periods of decline."

To this there is no denial. Business has no time to waste.

Variability

Things and forces vary. No two things are exactly the same. Because of variation the world is full—both of progress and trouble.

In the agricultural field, farms vary in size; yields vary in different fields and different seasons; the amount of work done per man and per horse varies.

How things vary is so fundamental to our agricultural and economic progress that it has become a subject of intense scientific thought. Degrees of variation have, therefore, been given index numbers—for instance the index of variability of the heights of men is 3.83.

Compared with this, two well known agricultural economists, G. F. Warren and F. A. Pearson, tell us all the measures of farming are very variable. The per cent of land in corn is, for instance, about six times as variable as the heights of men, and yet the corn acreage is more standardized than most other factors. The farmer's labor income is highly variable.

In the biological field, coefficients of variability above 30 are not common, whereas in the economic field such a low variability is very uncommon.

Man, in his economic life, has to deal with variation—change. His success depends on how successfully he can deal with change.

The common mistake is to deal with one factor only. As these economists say, "It is a balance of all factors" rather than any one that is important to success. Single track minds are doomed to failure in this age of rapid change.

Agricultural Forecasts

The value of agricultural forecasts has been questioned, and so the Secretary of Agriculture has written a letter explaining why the Department of Agriculture inaugurated price prediction reports on various agricultural products. The letter was written to the Hon. Joseph E. Ransdell, United States Senator, Lake Providence, La.

The Secretary explains that the principal reason for indicating probable prices is that "every farmer who gives serious thought to the business of farming must of necessity form some judgment as to future prices as a basis for planning his production and marketing."

The letter goes on:

> "As a rule farmers are guided too much by prevailing prices in relation to those received but a short while before. They increase cotton acreage and buy more fertilizer when prices are high, expecting them to remain high; they plant too little and buy too little fertilizer when prices are very low, apparently expecting them to remain low, and the consequence is great fluctuations in production and in the price for the crop. This condition exists in the production of nearly every agricultural commodity."

This is very true. Independent economic research has shown that there is a very high correlation between crop prices and the consumption of fertilizer on that crop the next season. The variability in fertilizer tonnage from year to year is, therefore, high—34.85 in some agricultural regions.

The farmer needs all the information he can get to make what adjustments he can to varying crop and other conditions. Change is the great problem with which he has to deal.

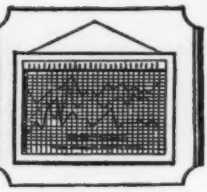
As the Secretary points out—"Very few individual farmers have in hand the necessary extensive information or are in position to make the necessary calculations as a basis for forming good judgments as to probable prices." Modern methods of statistical research are available. Business is able to organize such methods and get such information; 6,000,000 scattered farmers cannot get such information for themselves. Some agency must do it. As a service institution the Department of Agriculture does it for them.

The Department is doing a valuable work. No one expects any forecast, least of all do trained economists expect a forecast to be exactly correct every time. But regarded as an aid to judgment, forecasts, properly made, have a value in dealing with changing conditions that no other service can render.

The problem is adjustment to changing conditions. Such adjustments can be made better some time ahead of the change.

Because such predictions of coming changes are not exactly accurate all the time, is it better to sit down and do nothing? No! It is better that such efforts to foresee changing conditions continue so that in turn the changes themselves may be modified and the farmer have less violent fluctuations in his business. In making such adjustments information from every source should be used. As one source a scientific forecast is a useful aid to judgment. But no forecast yet devised will relieve any man from making decisions for himself. It will only help him.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Rust Losses Less

Because stem rust of wheat still persists in the 13 north-central states where the barberry-eradication campaign has been going on for 10 years, many persons have concluded the work against this disease is useless. The U. S. Department of Agriculture reports, however, that steady progress has been made and that persistence of the rust means that there are still large numbers of the bushes to be destroyed. The department men say that losses of wheat from this pest now, as a rule, amount to only about 16,000,000 bushels a year in the 13 states, whereas 10 years ago the usual annual loss from this cause was about 50,000,000 bushels. More than 14,300,000 barberry bushes were destroyed in the first nine years of the campaign, up to 1926. In 1926 more than 2,800,000 bushes were eradicated, more than in any of the preceding years, a good indication that many bushes remain to infest wheatfields.

Iowa Has New Weed

A kind of cocklebur with narrow hairy leaves and with three inch-long sharp spines at the axes of the leaves has been discovered growing along a railroad in west-central Iowa. According to Dr. L. H. Pammel, botanist of Iowa State College, the plant is a native of the tropics and probably has gradually worked its way north by means of the railroads. The bur of this weed resembles that of the ordinary cocklebur but is only about half the size. The spines, in addition to the burs, make the plant more dangerous to animals that may eat it, and if the pest gets into grain fields it will interfere with the comfortable handling of bundles. One fortunate characteristic of the weed is its short life. It is an annual and therefore will not be hard to kill.

A Great Crop

An Illinois agronomist says alfalfa acreage in the corn belt has increased more than 1,000 per cent in the last 10 years. The reasons given are that alfalfa is more resistant to drouth and winter-freezing than red clover and does not need renewing so frequently. The University of Illinois has some interesting figures on these crops obtained from the Davenport soil plots at Urbana. A five-year rotation of corn, oats, clover, wheat, and alfalfa has been grown for 16 years. Clover has failed six times while alfalfa has failed once, and that once because of insects. Where limestone and manure had previously been supplied, the average yields of hay during the period were 2.6 tons of clover and 3.2 tons of alfalfa. When rock phosphate was used in addition, yields were respectively 3.1 tons and 4.2 tons. Just as conclusive figures have been obtained in other sections of the state.

Back to Hand Feeding

The self-feeder has become very popular among hog feeders, but apparently it is not always desirable. The Nebraska College of Agriculture has found it pays better to feed tankage by hand than to let the pigs help themselves. The pigs on the test got

their corn in a self-feeder and some of them got their tankage the same way. Those that had their tankage whenever they wanted it made heavier gains than those getting a restricted amount, but they ate more than they needed for cheapest gains. It was found that heavy feeding of tankage did not decrease corn consumption but increased it.

Beaver Farms

One dandy thing about raising beavers is that you can keep them in their pastures with fences on only two sides. That sounds like a violation of some natural law, but it isn't. The Biological Survey says these clumsy slow walkers rarely go more than 20 or 30 rods from their home stream so that fences extending this distance at right angles on either side of the stream will keep the stock at home. The best place for such a farm is in the States along the Canadian border in localities where the aspen tree or the poplar grow well, trees that make good beaver forage but are of little commercial value. Cut-over regions that have been burned off and have grown up to aspen and pin cherry are often good locations for beaver ranches. The Department of Agriculture has a technical bulletin on beaver raising.

Artificial Turkey

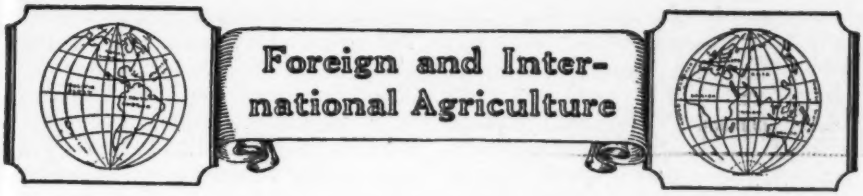
As a result of the cooperation of 800 men and women with the Minnesota Experiment Station in raising turkeys by the so-called artificial plan, it is expected that one million and a half of these birds will be produced. The turkeys are hatched in incubators and are kept in brooders for a time. Their entire lives are spent in close confinement, the yards being 4 feet wide and 40 feet long. Because of the danger from blackhead, carried by chickens, young turkeys are kept away from chicken flocks and on ground that has not been infected by them. Last year out of a lot of 33 turkeys grown at the station 29 mature birds were marketed in the fall at an average of 12 pounds each and the net return over feed cost was $3. In some of the lots there were no losses at all. A lot of 13 young turkeys were put in an old poultry house and within a month 11 of them had died of blackhead.

Rabbits Jump Ahead

The rabbit industry seems to be going ahead with leaps and bounds. In the West, particularly around Los Angeles, the production of rabbit meat has become a sizable industry. California is said to have more domestic rabbits than any other state. Now the Department of Agriculture has established an experimental rabbit station at Fontana, San Bernardino county, California. The work will be carried on by the Biological Survey of the Department in cooperation with the National Rabbit Federation and the Fontana Farms Company. The purpose of the station is to develop, for rabbit breeders and those contemplating raising rabbits, reliable information on the best methods of breeding, feeding, and housing to produce meat and fur of high quality.

Weevils Beware

A new fumigant, the most effective weapon yet devised against pests of stored products, has been developed by scientists in the Bureau of Chemistry and the Bureau of Entomology. It is made up of three parts by volume of ethylene dichloride and one part by volume of carbon tetrachloride. The report of the new discoverers indicates the new mixture will fill a need long felt by handlers of grain and various products as well as by householders who wish to protect rugs, other fabrics, and furniture. It is said to have the following qualities to recommend it: It is cheap; is non-inflammable; is not injurious to furniture or fabrics; is simple to use; and is not dangerous to human life when used as recommended.



The Use of Mineral Substances for Fertilization in Former Centuries

By Dr. O. Nolte, *Berlin* *Translated by* G. Brate

As can be seen from the statistics on the consumption of artificial fertilizer, the use of mineral substances for the fertilization of agricultural crops has increased considerably through the acquaintance with the theories of J. v. Liebig and the economic development in the most important civilized countries. However many centuries prior to that, a number of mineral substances often were used practically in order to increase the yield of the field.

The wide-spread occurrence of limestones had the effect that natural carbonate of lime, as well as burnt lime or occasionally gypsum, were used for fertilization in early times and in many parts of the civilized world. For instance the Bible contains remarks on the addition of marl to stable manure in order to increase its quantity and quality. The Roman writers cite many examples of its utilization on the field, and on their invasions to other peoples they transmitted their knowledge of its fertilizing effect. It is, therefore, a matter of course that it also was used frequently later on in many parts of the world and is still the basis of the fertilization with minerals.

Considerably scantier particulars as to other fertilizing materials are laid down by agricultural writers of ancient times. According to one of the oldest informations, by Plinius, in some districts of the Roman Empire straw ashes or wood ashes were applied on the field in order to supplement its nourishing power. The effect was known, and occasionally the application was used in medieval times.

When during the Renaissance the classic writings once more became known, the knowledge of the Ancients as to mineral fertilizers was spread also. Elaborate discussions on the theory of the fertilization with ashes as a necessity in order to prevent the exhausting of minerals are to be found in a book by B. Palissy written in 1563.

The invention of the gun powder at that time induced the production of calcium nitrate which together with wood ashes was converted into potassium nitrate. The residues obtained in this process contained varying quantities of potash, lime, and nitrogen, and were used very often in the neighborhood of the saltpeter works for the fertilization of the fields. As the price of saltpeter, as well as of the wood ashes or straw ashes, was comparatively high, these materials were often used only for soaking the seeds in order to provide them with the necessary foodstuffs.

In the course of the following centuries the number of materials that were used as fertilizers increased. For instance in the 17th century soot, horn-raspings, and soap residues were

often used besides ashes. As it was only little known that soot was effective particularly through its ammoniac compositions, and this was ascribed often to its organic substance, coal was frequently used for fertilizing purposes, without always having, of course, the expected result. Therefore, in the 18th century the argument whether stable manure was effective mainly through its minerals or through its organic substances played an important part in the fertilizer question. Already at that time, many exponents of the fertilizer theory ascribed its chief effect to the contents of organic salts.

Apparently also in ancient times the potash in the wood ashes or the residues of their manufacture into potash or soap were very favored, as many elaborate articles have been written on their application and effect. It is stated that they had a particularly favorable result on the papilionaceous flowers and in connection with the control of moss and similar weeds.

As a means to fertilize the field the burning of the soil, whereby particularly its potash and phosphates became more available, was also used to a great extent.

It can be seen from travelling reports from the more remote parts of the world that the fertilizing quality of mineral substances was widely known. Russia reports frequently about the fertilization with wood ashes and straw ashes. In China salt and bones in addition are favorably mentioned. In the 18th century in Central Europe also the use of salt, particularly the residues of the saltworks containing potash and magnesia, increased considerably. The salt works Friedrichshall near Heldburg (Germany) alone delivered within two years 15,000 cwt. of salt ashes to the farmers. Besides its favorable result as to fertilization, it is stated that also the destruction of some vermin, as snakes, was effected.

Towards the end of the century, England recommended the use of bones for the fertilization of the meadows and fields. On account of its good results, this practice spread within a short time over the most important civilized districts of the continent. This led in the middle of the past century to the production of superphosphate, the result of which was the commencement of the modern fertilizer industry. A very interesting writing by W. Pampadius enumerates all the materials which were known as fertilizers at that time, and none of the important materials which are used nowadays is missing.

While before that time the favorable result of saltpeter could only be utilized on some important crops, this was remedied by the discovery of the saltpeter deposits in South America so that from that time on the fertilization with nitrogen increased considerably. At the same time the supply of potash was limited, only being available in the form of wood ashes or in residues of its further manufacture.

Eager endeavors therefore were made at that time to utilize the sea water for this purpose. Shortly before the realization of this project, the discovery of the potash salts in Central Germany suddenly solved this difficult problem. The development of this new industry from small beginnings up to its present importance in a few decades characterizes the importance of potash fertilization.

An American was fined for being drunk. When he paid his money he asked for a receipt which was refused.

"Judge," said the man, "do you believe in a day of judgment?"

"Yes," replied the Judge.

"Well," said the other, "on that day it will be said to me, 'Jabez Smith, you got drunk.' 'Yes,' I will answer, 'and I paid my fine.' 'Where's your receipt?' it will be said: and do you think it reasonable, Judge, that I should be obliged to lose my time by going down to look all over hell for you and your clerk?"—*London Opinion.*

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Commercial fertilizers are essential for the production of flue-cured tobacco. This is the outstanding result of fertilizer experiments with this type of tobacco, conducted by E. G. Moss at the N. C. Tobacco Branch Station. The valuable results of this work are published in The Bulletin of the N. C. Department of Agriculture.

Of the three fertilizer elements, phosphoric acid is essential for all soils of the flue-cured district. The following quotation shows the importance of potash:

"Potash is perhaps the most important single constituent of the fertilizer mixture for growing tobacco from the standpoint of quality of product. This is indicated by the low average value per 100 lbs. when this constituent is absent from the fertilizer."

The ammonia supply is important. It must be under the control of the grower to produce best results. Mixed sources of organic and inorganic ammoniates gave somewhat better results than did any of the sources used alone.

Where "Sand Drown" is prevalent, magnesia must be supplied. For the most profitable amounts of fertilizer materials per acre, sources of fertilizer materials, etc., this bulletin will prove a valuable guide.

No potash salts are now on the market which contain a harmful amount of borax. This is an important finding of six years of experimental work by S. D. Conner, Purdue Agricultural Experiment Station, Bul. 307. Borax is dangerous to use with corn over ½ pound per acre. The harmful effects are confined to the early stages of growth.

The form of potash, sulfate or muriate, gives the same average yields. Because of the lower cost of muriate, the author recommends muriate for the corn crop. That potash is very necessary for corn on many soils is shown by the photograph of the Rensselaer experimental field. No potash—no corn. On certain soil types potash is very essential for profitable yields of corn.

Tobacco on old tobacco soils that have been heavily fertilized with phosphates, does not respond to additional applications of phosphates. Long continued applications of phosphates build up a surplus more than sufficient for the crop. These and other interesting results have been obtained from five years of experimental work at the Windsor (Conn.) Tobacco Experimental Station. Phosphorus is necessary for the growth of tobacco, but as very little leaches away large quantities have accumulated in many tobacco soils.

The practical conclusions of the author are that growers may reduce the phosphate content of fertilizers for old tobacco fields for many years without harm, as the available phosphorus does not revert to forms unavailable to the tobacco plant. In terms of dollars, at least half the money paid for phosphates for tobacco in New England can be saved.

Georgia State College of Agriculture has issued a very practical little circular on new fertilizer materials,

especially the newer sources of nitrogen. It provides a handy table that gives at a glance the plant food content of these materials. The circular is No. 135.

"The Stimulation of Plant Response on the Raw Peat Soils of the Florida Everglades Through the Use of Copper Sulphate and Other Chemicals," Agr. Exp. Sta., Gainesville, Fla., Bul. 190, Sept., 1927, R. V. Allison, O. C. Bryan, and J. H. Hunter.

"State Laboratory Fertilizer Report, Seed Report, Jan.-June, 1927," State Board of Agriculture, Dover, Del., Vol. 16, No. 4.

"The Effect of the Constituents of Alkali, Fertilizers, and Soil Amendments on the Permeability of Certain Fine-Textured Soils under Irrigation," Agr. Exp. Sta., State College, N. M., Bul. 160 (Tech.) Feb., 1927, C. W. Botkin.

Soils

The Soils Department of the Iowa Agricultural Experiment Station has recently completed soil surveys for O'Brien, Green, Des Moines, Benton, Grundy, and Floyd counties.

In presenting the results of these surveys, a vast amount of interesting data concerning the geology, agriculture, and use of commercial fertilizers has been discussed.

Of particular interest is the discussion regarding the use of potassium fertilizers. While the amount of potassium in these soils is high, it is made clear that in order to have it available in amounts desirable for highest crop yields, considerable care as to cultivation and drainage, correction of soil acidity, and the use of farmyard and green manures is necessary. Furthermore, it is recommended that tests with potash fertilizers be tried on a small scale and if profitable be used more extensively.

The general use of complete commercial fertilizers is not recommended except for truck and garden crops. On these crops its use may frequently result in a distinct profit. Farmers are urged to test recommended brands of complete fertilizer against acid phosphate. If profitable yields are secured, then by all means, they should use it. After all, it is entirely a question of profit secured from the treatment which counts.

"Soil Temperature Studies with Cotton," Agr. Exp. Sta., Gainesville, Fla., Bul. 189, Sept., 1927, A. F. Camp and M. N. Walker.

"Soil Sterilization for Seedbeds and Greenhouses," Agr. Exp. Sta., Fort Collins, Colo., Bul. 321, May, 1927, Walter G. Sackett. ..

"A Classified List of Soil Publications of the United States and Canada," U. S. D. A., Washington, D. C., Bibliographical Contributions No. 13, June, 1927.

Crops

A most interesting publication, Bul. 451, "The Development of Agriculture in New Jersey, 1640-1880" came this month. Carl Raymond Woodward in this work has set down the agricultural history of this commonwealth in a style which makes for easy and entertaining reading. Well illustrated with cuts of some of the earliest agricultural publications of this country, the volume is one which should find a place of value in all agricultural libraries to complete their records of the great industry, agriculture. While confined largely to the development of New Jersey, much that pertains to early colonial agriculture can be found in the publication.

A number of other interesting bulletins this month covering current problems in almost every section of the country can be found in the following list:

"Range Grasses of California," Bul. 430, Agr. Exp. Sta., Berkeley, Cal., Sept., 1927, Arthur W. Sampson and Agnes Chase.

"The Kadota Fig, Part 1; and "Kadota Fig Products, Part II," Agr. Exp. Sta., Berkeley, Cal., Bul. 436, Oct., 1927, Ira J. Condit and W. V. Cruess.

"Permanent Pastures," Col. of Agr., Athens, Ga., Cir. 136, Vol. XVI, July, 1927, Paul Tabor.

"Suggestions for Improving Corn Yields," Col. of Agr., Athens, Ga., Cir. 137, XVI, July, 1927, Paul Tabor.

"A Year's Progress in Solving Farm Problems of Illinois," Agr. Exp. Sta., Urbana, Ill.

"Annual Report for the Year Ending Dec. 31, 1926," Ext. Div., Col. of Agr., Lexington, Ky., Cir. 208, May, 1927, T. R. Bryant.

"Alfalfa in Nebraska," Agr. Exp. Sta., Lincoln, Neb., Bul. 222, July, 1927, T. A. Kiesselbach and Arthur Anderson.

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Pages From A Field Note Book

Here and There

By H. T. Maddux

Atlanta, Georgia

MORE than 70 bushels of corn per acre on 150 acres of land is the record which J. B. Seay of Spartanburg county, South Carolina, established in 1924, a very dry year. His soil was a Cecil sandy loam to clay loam. The fertilizer used was 400 lbs. per acre of a mixture analyzing 10 per cent phosphoric acid, 5 per cent nitrogen, and 6 per cent potash, with 50 lbs. of nitrate of soda as a top-dressing. Practically the same yield was obtained in 1925, another relatively dry year, with the same fertilizer.

David C. Strother, manager of the Fort Valley Cotton Oil Company, Fort Valley, Georgia, uses 15 per cent potash in his fertilizer mixtures for peaches on his own orchard. Mr. Strother has stated that he cannot afford to jeopardize the firmness of his fruit and its shipping quality for a few cents worth of potash per tree.

A number of farmers around Trenton, South Carolina are applying 1,000 lbs. of 20 per cent manure salts per acre as a top-dressing for asparagus each year in addition to their regular fertilizer of two tons of a 7-5-5 mixture. This development in the fertilization of asparagus has come through the efforts of F. W. Miller, manager of the Trenton Fertilizer Company. The farmers of that section have found that the application of manure salts returns big profits.

County Agent A. E. Gibson of Dawson, Terrell county, Georgia has carried on fertilizer tests for several years with cotton on Coastal Plain soils. In 1928 he plans to use a minimum of 5 per cent potash on red soils and 7 per cent on gray soils. In a recent interview Mr. Gibson emphatically stated that his tests showed that high amounts of potash did not delay the maturity of cotton, and that in some cases it hastened maturity.

Three hundred and fifty-seven pounds of seed cotton per acre for one 200-lb. bag of kainit, used as a top-dressing, is reported by E. G. Jones of Wadesboro, N. C. The demonstration was conducted this year with two plots of one acre each on a Norfolk sandy loam soil. Both acres were fertilized with 600 lbs. of 8-3-3 and 100 lbs. of sulphate of ammonia. The kainit acre produced 1,628 lbs. of seed cotton and the regularly fertilized acre 1,271 pounds.

Ed Clary, of Gaffney, S. C., has found that top-dressings of kainit applied to oats, either in the fall or early spring, at the rate of 300 to 600 lbs. per acre, completely control rust and give greatly increased yields. The kainit also stiffens the straw of the oats, making harvest easy. Mr. Clary's soil is a Cecil sandy loam to clay loam.

On a four-horse farm in 1927, Holloway Norris, of Meansville, Ga., produced about $7,500 worth of cash crops, in addition to vegetables and minor food products. His record is 49 bales of cotton from 46 acres, 800 bushels of oats, 700 bushels of corn, 30 tons of peppers from six acres, and 25 market hogs. Mr. Norris is a firm believer in diversification and liberal fertilization.

Increased Yields

By James Graham

Batavia, New York

DURING the seasons of 1925 and 1926, Henry C. Wolfe, Hardys, New York, ran tests on potatoes, using straight acid phosphate and a mixture analyzing 0-10-10. He used 1,000 pounds of acid phosphate on one plot, and 500 pounds of 0-10-10 on another, the money value being the same. The difference in yields obtained where the acid phosphate and the 0-10-10 were used was quite apparent. The rows where the 0-10-10 was used could be picked out easily, and the yield was increased from 50 to 75 bushels over the yields where acid phosphate only was used.

Making Farm Credit Easy

(*From Page* 28)

quests from commodity associations for loans increase and the commodities can be proved from the standpoint of keeping quality and standard grades of the commodity offered.

Some farmers, of course, are not benefited by this type of loan. Only members of cooperative marketing associations can borrow directly from the Intermediate Credit Banks and they borrow through their associations. The requirements governing loans of this character vary somewhat according to the problems encountered in producing, processing, warehousing, and marketing the commodity loaned upon. However, no cooperative marketing association which could come within the provisions of the Act has been refused a loan. The Board does not insist upon Federal warehouses, although many loans upon which Intermediate Credit money has been advanced represent products stored in them, neither has the Board always insisted upon state licensed warehouses. In fact, some of the state warehousing laws are so poor as to be almost worthless, either from the standpoint of the law itself or the way it is administered.

The fact that the law limits the amount which may be advanced upon products so warehoused and secured by warehouse receipts is a matter of constant agitation among some people who believe that the 75 per cent mentioned is not adequate and that the farmer should be able to borrow a higher percentage of the current value of the product. That, however, is a matter which is entirely in the hands of Congress.

Some people believe that so long as the Federal Intermediate Credit Banks have to depend upon the sale of debentures to the investing public for their funds that more than 75 per cent is not desirable; that that might have the effect of raising the interest rate on the debentures and therefore to the farmer; that 75 per cent gives the cooperative opportunity to pay the producer for the majority of his crop at the time that he delivers it; and that the farmer should be satisfied with that amount.

Others, however, say the cooperative should pay as high as 90 per cent or more still, and some advocate that the full market price be advanced when the products are delivered to the cooperative's warehouse. Of course, the latter provision would make it possible for them easier to

compete with spot cash buyers, but it is questionable whether 100 per cent could be advanced if the Intermediate Credit Banks depend upon the money from the sale of their debentures. An alternative plan might be evolved whereby the Intermediate Credit Banks could continue to advance 75 per cent and the balance could be obtained elsewhere. However, the last 25 per cent would doubtless cost the cooperative a much higher rate of interest than the rate charged on the 75 per cent because of the probable fluctuation in the selling price and the possible vanishing of the lender's collateral. This plan of lending 100 per cent does not seem to be altogether practicable.

The service which the Intermediate Credit Banks have rendered to date, however, can not be measured entirely by the amount of money which they have loaned. A number of cooperatives have found that after the Intermediate Credit Banks had agreed to lend them money and thereby give their stamp of approval on the loan as being safe and sound, that other banking agencies were willing to supply the money. In many instances the commercial banks have furnished loans for short periods and the Intermediate Credit Banks have loaned for six months and longer.

Congress provided the 12 banks with a potential lending power of $660,000,000. They have lent about $500,000,000 in four years and now have outstanding about $80,000,000 to $90,000,000. The system is flexible; responsive to the demands of the cooperatives; and beyond a doubt would reach its maximum service quickly should the short-term commercial banks find themselves overstocked with slow-moving agricultural paper as they did a few years ago. There is no doubt but what the need for intermediate credit is a real one and that its services will be extended as the demand increases.

Cutting Cotton Costs

(*From Page* 30)

the deflation period, southern farm land values have moved along on a level, at first above but in late years below the wage level.

The cheapest of these three principal items in the cost of cotton production since 1920 has been fertilizer. Land, labor, fertilizer—and the lowest of these is fertilizer.

It is fortunate for that part of the Cotton Belt which lies east of the River that this is so. The Old South is up against the economic battle of its history. It is facing substantially the same kind of readjustment as New England faced two generations ago when the West took over her cattle, sheep, and grain industries.

The West is making a bid for cotton supremacy now. If the eastern belt wants to go on making cotton it has got to sluff off some of its ancient system and meet competition with improved methods. New England replaced her grain and meat industries with a more intensive system of dairying, fruit, poultry, and vegetables. The Old South will have to meet the cotton situation with a similar intensifying of production methods. That means especially using the better land, using more fertilizer on it, and cutting down the labor cost by the use of machinery.

Cotton braced up in price this spring. The world is going right on using cotton. Somebody is going right on making a living growing cotton. Texas and Oklahoma have learned the trick. The eastern belt can stay in the game but only by a system which cuts the cost of production to the minimum.

The Extension Worker

(*From Page* 12)

der, are ridiculed by their associates. A sale that is not closed is not a sale, it is only a likely prospect. Closing the deal by honest methods and fair dealings is what appeals to both the salesman of goods and the salesman of better methods in agriculture.

To the agricultural extension worker, however, closing the deal means something a little different than it does to the salesman of goods. At the close of a farmers' meeting or demonstration, those farmers who give the specialist their names and addresses, stating that they expect to put into operation the farm practices or methods recommended, are as truly closed with as prospect or customer who purchases merchandise or goods by signing the order blank on the dotted line. Such farmers become bona fide cooperators or customers and the extension worker may continue to sell them ideas regarding better farm practices just as the salesman may continue to sell his customers more modern and useful merchandise.

Relation of Work

As public institutions the College of Agriculture and the private corporation, by perfecting and continuing their relationships, will come more and more to know the satisfaction which always goes to the seller who has furnished the buyer with that which he really needs and which will give him service. To both, therefore, will go the support and praise of all the people with whom they work.

There is also another striking relation between the two kinds of work, which has more to do with keeping men in the service than any other factor. When either of these workers has performed a real service to the farmer or the merchant, he is stimulated with a sense of satisfaction in that he has been of a real service to others in addition to earning his bread. He, therefore, works for the love of work, not necessarily because it is required in order to make a living. Both kinds of workers are imbued with the missionary spirit or a desire to serve.

Sales Are Required

Much of our extension work is of such a nature that a sale of some sort is required in order that the farmer may put into practice the teachings recommended by the college specialist. For example, the horticulturist may emphasize the necessity of spraying, pruning, and cultural practices in making the commercial orchard a paying proposition, but unless the farmer buys a spraying outfit, spraying chemicals, pruning tools, and such other materials and implements as he needs, the specialist has not sold his orchard improvement idea. Neither will the fruit grower make a success of his orchard operations until he does invest in these necessities.

Likewise, no matter how forcefully or eloquently the home demonstration agent may teach and demonstrate regarding home improvement, unless the farmer purchases a water system, electric lighting plant, and the other equipment needed to make the improvements required, we will not get very far with our teaching. Where much of the work in agriculture as agents of all the people, representing a public institution, stops, the work of the business or private corporation begins, and one or many sales may be required to complete the cycle. It is, therefore, of paramount importance that the workers of both groups cooperate to the fullest extent if they are to be of the greatest service to those with whom they work and to the institutions which they represent.

Due to a lack of knowledge regarding the place, work, and need of the Colleges of Agriculture and business establishments and private corporations, there has not been as free and as hearty cooperation between them in the past as there should have been. In recent years, however, great progress has been made toward the development of better relationships and both organizations should make more rapid and worth while advancement in the future.

As long as agricultural workers and business salesmen continue to sell ideas and goods which are honest, sane, safe, and practical, both are builders and real factors promoting progress and development. It must also be said that they are of great value and our people cannot make rapid advancement if they are lacking.

Telling Plants

(*From page* 23)

The horticulturist will see at a glance that he can synchronize the blooming of various plants which formerly bloomed at different periods of the year. For instance, he might make an early spring bloomer and a midsummer bloomer flower together. That would give him pollen for cross breeding. So will be created new kinds of plants that hitherto it has been utterly impossible to create, since the flowers did not bloom at the same time.

The possibilities are staggering. It will be decades before we begin to realize largely upon these possibilities. But in the meantime all of us can profit by these discoveries. All one needs for home experimentation is a darkhouse and an electric light. Doubtless a tight, ordinary box is the simplest form of darkhouse. It would need bent pipes top and bottom for ventilation. A darkened coldframe would be easy to make. Or one might darken the tool house and run potted plants in and out on a wheelbarrow. At almost no expense and with very little labor one could test out the possibilities in one's own garden.

Surely those who love fall flowers would find it worth while to have a few of them in summer, when blooms are relatively scarce. It would be worth while, too, to have lettuce stay in head instead of shooting up to flower. Also, it would be worth while to deck the dinner table with iris in January. All one needs to do is to hang an electric light bulb by the iris pot and turn on the light when the sun sets, burning it until perhaps ten or eleven o'clock.

There are mighty interesting possibilities here for the home experimenter. For those who would like to pick up a few dollars there are also likely openings. The day will probably come when the darkhouse is just as essential a part of the florist's equipment as the hothouse is now. The pioneers in this new method of handling flowers will profit largely.

From Cattails to Fertile Farms

(*From Page 16*)

hot in search of the best wholesale markets, but they see that plenty of cars are on the tracks at loading time so a minimum of spoilage results.

At the time we were there Blocker was attending the vegetable growers' convention at Syracuse, New York, in the hope of finding new ideas along market gardening lines. We were able to talk with Davis although he was rather busy as he had to attend to Blocker's work as well as his own. He told us that there is little need for government aid for farmers in this day and age where you will always have a market at a good price if you produce quality products.

The Hollandale Brand

"Potatoes here are grown on disease-free ground," he said. "They are all treated for disease during the growing season, and much of our tonnage is certified seed. Clean seed on clean ground, properly fertilized, and adequately cared for makes for good quality.

"State and government officials inspect the potatoes right on the loading platform before they can go out under our brand. If they do not come up to grade, the farmers have to take them back and they may not sell them in sacks stamped with the Hollandale brand. We have a standard pack and are always able to find a market. Even in 1924, which saw the biggest potato crop the United States has ever had, you could buy potatoes in many places for 15 cents a bushel but we averaged $1.15 a hundred on over 250 carloads. The inspectors have very little to do now because the farmers realize that only good quality stuff may be shipped through the association, but the fact that a car bears the government O.K. gives a buyer more confidence in the load. All the farmers have their own box graders which are set at the standard inch and seven-eighths size. They sell most of their culls to truckers and usually realize a fair price even on these seconds, for they are pretty good. The average potato yields are around 350 bushels per acre with very few poor ones produced."

In the search for markets for certified seed potatoes, the association shipped an entire carload to the Henry C. Hollman Produce Company of St. Louis, Missouri, for free distribution among the potato growers in the southern territory. These potatoes were grown under the supervision of Minnesota's agricultural department, field inspected by state inspectors not less than three times during the growing season, rogued in some fields as many as seven times for purity and disease, treated for disease before planting, sprayed for blight while growing, and were graded according to the strictest state requirements when they were harvested. This free seed distribution in 1924 resulted in the sale of 397 cars of certified seed to the Hollman company alone in 1925 at a premium of 70 cents a bushel above the price of first-class table stock.

Fertilizer Practices

Davis said they are unable to supply the demand for this seed and he attributes this to the quality of seed produced. High quality and large yields on muck lands are so dependent on the correct use of fertilizers that we asked Davis to give us some of the more outstanding successful fertilizer practices in the district.

"Our Hollandale soils," he said, "were formed by the falling down of sedge, cattails, wild rice, and other heavy vegetation. This has made a soil that is composed almost entirely of humus or organic matter and which

is very rich in nitrogen but is very low in phosphate and potash. Therefore, although the soil is naturally fertile, it has been necessary to add these two elements for the vegetable crops that are being raised. Fertilizer recommendations for this soil were received from Dr. F. J. Alway of the University of Minnesota, and extensive experiments were then made with fertilizers for the various crops.

"At the present time it has been found that the 0-9-27 fertilizer applied under the rows for potatoes has been giving the best results. Potatoes on this soil will produce from 100 to 150 bushels to the acre without fertilizer, but by using the 0-9-27 mixture the average yield has been increased to nearly 350 bushels and individual yields of more than 500 bushels have been obtained. The quality for table or seed purposes, too, has been very greatly improved as has the resultant price per bushel.

Frost Resistant

"It has also been found that fertilized plants resist frost to a much greater degree than unfertilized ones. This year we found stretches in fields where the fertilizer attachment had clogged. The first heavy frost last August mowed the plants in these stretches right to the ground while only the tip leaves on the rest of the plants were nipped. Residual effects of fertilization could be noticed, too, for there was far less damage from frost on fields that had been heavily fertilized three years in succession than on new ground that had been fertilized only once. I think the reason for this is that the fertilizers increase the mineral concentration in the sap so they make the plant more resistant to frost. It works the same way when you add salt to water to form brine. The salty water will not freeze so quickly as the fresh.

"Six hundred pounds to the acre of 0-9-27 fertilizer seems to give the best results for cabbages and carrots. Celery growers too apply this mixture broadcast at the rate of 1,000 to 1,500 pounds to the acre. Some growers apply sodium nitrate in addition at the rate of 400 to 500 pounds to the acre along the celery rows in four applications during the growing season."

"We have found that onions need a larger percentage of phosphate than other crops in order to hasten maturity and make good hard bulbs. Most growers apply 1,000 pounds to the acre of 0-14-14 fertilizers, but some of them use a 2-14-14 mixture in addition, as a little soluble nitrogen has been found helpful to start the plants off before the natural soil nitrates become available. From 200 to 300 bushels of small onions per acre can be grown here without the use of fertilizers but by the use of the aforementioned application the average production per acre is from 500 to 600 bushels of fine large quality onions and many growers get from 800 to 1,000 bushels to the acre.

"The residual effects of all these fertilizers is quite marked. The crops the following year show very plainly that some of it remains unused in the soil. If grain is planted on a field which had an application of fertilizer along the potato rows the previous year, the grain stands much higher and heads earlier in these rows. It is believed at present, that after a few years of heavy applications of fertilizers to these soils that the amount may be reduced without lessening the yields or impairing the quality. The experiments at Hollandale, however, have proved that no matter how rich a soil one may have, it is usually deficient in some of the elements needed for optimum plant growth. Experiments will show just which elements are needed to make a proper balance and will show which fertilizers will give the best results.

"The chemical analysis of a soil in general is not very satisfactory as an indication of the crop that you can raise from the land, for one cannot tell just how much of this food will become available in any one year. There

seems to be quite a misunderstanding among a great many farmers throughout the United States in regard to the use of fertilizer. Many of them believe that its use will put the soil into some condition that will necessitate the use of increasing amounts every year. So far as I know, and certainly so far as our Hollandale trials indicate, there has never been any data to prove that this belief is correct. The application of fertilizer is nothing more or less than the addition of necessary plant food."

A Bright Future

About the time we reached this point in our interview, a large potato buyer came into the office and it happened that Davis and he were boyhood friends who had played football on opposite elevens in their college days. Sensing the coincidence as one that would develop into an extended conversation over "old times" we went on our way to see some of the beautiful fields that lay on either side of the excellent gravel highways.

We drove over to Henry Voss' celery farm where this Holland-born lover of beautiful crops, with his wife and son, was packing celery. Voss got some early training in growing vegetables when he worked on a government experiment farm in Holland, but he had never seen any celery until he landed on his future father-in-law's place at Kalamazoo, Michigan. That was in 1900. He has been specializing in celery ever since. He says that he has never grown such crisp, white, tender stalks as he cuts at Hollandale. He has not found the use of a nitrate top-dressing to be profitable, but he gives his five-acre field a heavy application of barnyard manure once every three years in addition to a yearly application of 1,000 pounds to the acre of 0-9-27 mixture.

From Voss' beautitful home we drove over to have a talk with Peter Van Erkel and C. Kraay, two ambitious young gardeners who once lived and worked together near Doorn, Holland, where the former Kaiser of Germany now resides. They were storing an 800-bushel per acre crop of fine white Southport onions in Van Erkel's shed. These two farmers follow the same fertilizer practices. They own all their machinery in common as each of them has only a 20-acre farm and they both have practically the same acreages in each crop. They exchange work at planting and harvest time, and Van Erkel does the chores for Kraay on days that the latter must be away late with their jointly owned truck. They both use 650 pounds per acre of 0-9-27 fertilizer for potatoes and carrots, which is slightly more than the average as given by Davis. Then, too, they find a 1,200-pound application of 0-14-14 fertilizer on onions to be more profitable than a 1,000-pound application. An additional 200-pound application of 2-14-14 mixture is broadcast at planting time, too, since they believe that it pays to hurry the young plants along with a good start.

Although Van Erkel and Kraay have farmed near each other in Holland, Iowa, and here, they find their little Hollandale farms to be the most profitable ones that they have operated. Van Erkel is a bit of a traveler. He has helped his father in a trading position in South Africa. He has crossed the ocean seven times, but he says he enjoys his beautiful, flower-decorated Minnesota home better than any he has lived in. Perhaps this enjoyment comes from the fact that he has sold between $6,000 and $8,000 worth of crops from the little farm every year since he came there.

We saw dozens of prosperous looking farms and many beautiful fields of onions, celery, potatoes, cabbage, and carrots all through this section and would have enjoyed visiting with more of the farmers. However, it was getting near time to go home, and so we passed them up. Our guess for the future of this section is that it will be bright if the same care is practiced in marketing only high quality stuff.

Reviews

(*From Page 46*)

"A Preliminary Study of 127 New Mexico Ranches in 1925," Agr. Exp. Sta., State College, N. M., Bul. 159, Jan., 1927, A. L. Walker and J. L. Lantow.

"Abstracts of Papers not Included in Bulletins, Finances, Meteorology, Index," Agr. Exp. Sta., Orono, Me., Bul. 335, Dec., 1926.

"Ringing Applied to the Commercial Orchard," Agr. Exp. Sta., Wooster, Ohio, Bul. 410, Sept., 1927, J. H. Gourley and F. S. Howlett.

"Varieties of Apples in Ohio, II," Agr. Exp. Sta., Wooster, Ohio, Bul. 411, Oct., 1927, C. W. Ellenwood.

"The Formation and Development of the Pistillate Flowers of the Pecan," Agr. Exp. Sta., Stillwater, Okla., Bul. 163, Feb., 1927, D. V. Shuhart.

"The Influence of Crop Plants on Those Which Follow, III." Agr. Exp. Sta., Kingston, R. I., Bul. 210, Sept., 1927, Burt L. Hartwell, John B. Smith, and S. C. Damon.

"Small Grain Experiments," Agr. Exp. Sta., Clemson College, S. C., Bul. 242, Oct., 1927, T. S. Buie, W. B. Rogers, J. D. Warner.

"Crop Rotation in the Blackland Region of Central Texas," Agr., Exp. Sta., College Station, Tex., Bul. 365, Sept., 1927, E. B. Reynolds and D. T. Killough.

"Strawberry Varieties in the United States," U. S. D. A., Washington, D. C., Farmers' Bul. 1043, Geo. M. Darrow.

"Origin and Distribution of the Commercial Potato Crop," U. S. D. A., Washington, D. C. Tech, Bul. 7, July, 1927, J. W. Strowbridge.

"The Jerusalem Artichoke as a Crop Plant," U. S. D. A., Washington, D. C., Tech. Bul. 33, Oct., 1927, D. N. Shoemaker.

"Report on the Agricultural Experiment Stations, 1926," U. S. D. A., Washington, D. C., Sept., 1927.

Department of Agriculture Immigration of Virginia, Bul. 238, Oct., 1927.

Department of Agriculture Immigration of Virginia, Bul. 239, Nov., 1927.

"Filbert Culture," Experiment Station, Puyallup, Wash., Bul. 6-W, New Series, Oct., 1927, H. D. Locklin.

American Potato Journal, Washington, D. C., Vol. IV, No. 10, Oct., 1927, Ellwood Douglass.

Diseases

It is one thing for a farmer to recognize diseases in his crops. Far more important is it that he be able to identify the disease and know how to treat it. Bul. 313, "Common Diseases of Colorado Truck Crops," by L. W. Durrell and E. L. LeClerg, presents this information in text and splendid illustrations. More publications of this type from different experiment stations would be of great service to farmers in the production of their crops.

"Suggestions for Control of Root-Knot of Tobacco," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 401, Sept., 1927, W. B. Tisdale.

"Treatments for Wheat, Oat, and Barley Smuts," Col. of Agr., Athens, Ga.; Cir. 138, Vol. XVI, Aug., 1927.

"Powdery Mildew of Peas," Agr. Exp. Sta., State College, N. M., Bul. 163, June, 1927, R. F. Crawford.

"Spraying for Prevention of Apple Blotch and Apple Scab," Agr. Exp. Sta., Wooster, Ohio, Bul. 413, Oct., 1927, F. H. Ballou and I. P. Lewis.

"Spraying for the Control of Fig Rust," Agr. Exp. Sta., College Station, Texas, Cir. 47, July, 1927, W. B. Lanham, R. H. Wyche, R. H. Stansel.

Insects

A report of the present status and method of control of "The European Corn Borer," has been published in Farmers Bul. 1548, U. S. Department of Agriculture. D. J. Caffrey, Entomologist of the Department, and L. H. Worthley, Administrator in Corn-Borer Control, are the authors. To corn growers, the news in this interesting and well illustrated bulletin will be valuable.

"Insecticidal Control for Sugarcane Borer," Agr. Exp. Sta., Baton Rouge, La., Bul. 201, Aug., 1927, W. E. Hinds and Herbert Spencer.

Economics

The growth of cooperative marketing has been accompanied by many different plans and methods of selling. No one particular method is satisfactory for all commodities. There are special and individual problems to be solved for each commodity and each locality.

"Some Economic Problems Involved in the

Pooling of Fruit," H. E. Erdman and H. R. Wellman, Agr. Exp. Sta., Berkeley, Calif., Sept., 1927.

Bulletin No. 432, analyzes some of the economic problems involved in the pooling of fruit. The advantages of pooling fruit as compared with selling on the individual growers' accounts are: (1) pooling gives the individual grower better insurance against the risks of marketing; (2) pooling facilitates the transfer of the control of the product from the members to the management; (3) certain costs may be reduced by pooling.

Some of the important factors affecting the pooling plan are: (1) the accuracy with which the fruit can be graded; (2) existence of normal seasonal variation in prices of the fruit; (3) importance of market risks.

Report of the Secretary of Agriculture

Agriculture has regained more than three-fourths of the buying power lost per unit of its products in the post-war price decline.

This is the important note in the report of Secretary of Agriculture W. M. Jardine, for 1927, just off the press.

After analyzing the situation of each crop district and each branch of the livestock industry, the Secretary concludes that in general the showing for the year is good. Yet much remains to be done before the position of the farmer will cease to constitute a problem.

In order to achieve higher net incomes for agriculture, advance is necessary along several lines. While farmers themselves are reducing their costs of production through increased efficiency, public agencies should cooperate with them in effecting a better adjustment of production to demand. Also efforts should be made to diminish waste, to lessen margins between producers' and consumers' prices, to reduce transportation and distribution costs, and to lessen the farmer's overhead charges by lowering or redistributing tax burdens and by improving agricultural credit facilities. Farmers should be encouraged to enhance their bargaining power through cooperative marketing, and the responsibility of the public in helping to reduce price fluctuations due to unavoidable gluts and shortages of agricultural products should be recognized in a practical manner.

Overemphasis on the fairly satisfactory results of a single year may cause us to forget the existence of underlying causes of farm difficulty, and therefore to neglect practicable means of affording relief.

The report is a very comprehensive and encouraging survey of the year's agriculture.

Oregon

(*From Page* 20)

tions of wheat under the same painstaking systematic study. Improved strains look promising to meet weaknesses of older ones. Two new selections of Hard Federation will be distributed to farmers for trial in 1928. For western Oregon, Jenkin wheat is proving nearly as outstanding as Federation for eastern Oregon.

In western Oregon the introduction of Hungarian vetch has been an outstanding accomplishment in the field of forage crops. This is an aphid-resistant vetch, equal in seed quality to common vetch, but suited to soils too wet and cold and poor for ordinary vetches. The first seed was released to farmers only about six years ago, and the crop is now widely distributed. Introduction of alfalfa into the Willamette valley, where for a generation it was thought that the crop could not

be grown, was another revolutionary accomplishment.

No discussion of the Oregon station would be complete without mention of its nationally recognized accomplishments in poultry breeding. In 1908, when the experiment station adopted a definite program in poultry improvement, there was not a commercial flock in the state, nor was there a trap nest, and the farm flocks were very ordinary. Poultry productions were being shipped into the state; now, 20 years later, the poultry industry of Oregon holds a high place. High quality eggs are marketed in hundreds of carloads on Eastern markets. Annual production is now estimated at $10,000,000. Commercial flocks averaging 200 eggs per bird per year are common, and the state is known as a center of poultry breeding.

A Profound Influence

That the station accomplishments have had a profound influence on this development, there can be no question. Thousands of eggs from the high laying fowls developed at the station, as well as many breeding birds, have been shipped throughout the state to become foundations for farm flocks. Many breeders make a large point in their advertising of the fact that their flocks have been built upon foundation stock from the station. On the station the breeding stock from which the start was made produced as follows: White Leghorns, 106 eggs; Barred Plymouth Rocks, 86 eggs per year. Within five years the White Leghorn flock was producing above a 200-egg average and the first 300-egg hen in the world, a White Leghorn, had been produced. More than 100 articles were written about this hen. In 1922 the station published the following conclusions:

"(1) High fecundity is inherited.

"(2) Selecting breeding stock on the basis of annual trap nest records regardless of prepotency or tested qualities is a certain method of increasing egg production.

"(3) Some hens and some males have the power of transmitting high fecundity; others have not this power. More rapid progress will be made in increasing production of the strain if only those hens and those males be used in the breeding pens that have shown by the egg records of their pullets or by the progeny test that they possess the power of transmitting high egg production."

In the field of soil fertility, perhaps the greatest accomplishment of the experiment station has been the discovery of the value of sulphur as a plant food. On 100,000 acres of alfalfa land in the state applications of 40 to 50 pounds of sulphur annually increase the yield of hay obtained a ton to a ton and a half per acre, and the cost is nominal, running less than $2.00. At this time, about 30,000 acres of alfalfa are thus treated. In a similar manner it has been determined that phosphate fertilizers are the basis of restoration of fertility to the worn-out grain lands of the Willamette valley, cropped continuously for

a generation.

Oregon is a state of marked topographical differences. Divided into six major regions, some of these differ as widely as do the widely separated states of North Carolina and Montana, for example. In the counties breasting the Pacific Ocean there are regions of 80 to 100 inches of rainfall. East of the Cascade mountains there are deserts where five or six inches of rain is the annual average. Extensive agricultural operations prevail along the heavily watered coast, and, likewise, extensive agricultural operations are carried on under an annual average precipitation of 11 inches. Properly to serve the agricultural industry in these districts of widely diversified conditions, seven branch experiment stations have been established under the administration of the director of the Oregon Experiment Station. Each of these is locally in charge of a resident superintendent and a staff, which force is augmented by the scientific men of the central station at Corvallis.

The oldest of these branch experiment stations is at Union in the Blue Mountain region. This station, established in 1901, gives particular attention to the livestock industry, which is predominant in that region, with some minor attention devoted to field crops. Extensive experiments in the wintering of stock cattle, fattening of steers, and handling of range sheep, have been carried on. The value of silage in fattening Northwestern steers has been established, as has the fact that an ambitious outlay for buildings is unnecessary under range conditions, the stock wintering with only fair shelter having equalled in gains, and at times exceeded the stock more carefully cared for. Likewise, it has been determined that since the most economical gains are made on the range during grazing, growing rations during the winter season are an important factor in the economical production of beef.

To serve the dry land, wheat-producing areas of the Columbia Basin where the summer fallow method is standard, a branch station was established at Moro in 1909 in cooperation with the United States Department of Agriculture. Perhaps no phase of the Oregon Experiment Station work has been adopted by a greater percentage of the persons affected, than is the case with the results obtained at Moro. As a direct result of this station's work, wheat-growing practices in an area producing 12,000,000 to 15,000,000 bushels of wheat annually have been revolutionized; for example, 13 years' experience at Moro shows that an average of a bushel per acre per week is lost for every week plowing of summer fallow is delayed after mid-April.

Harrowing Impracticable

Harrowing of spring grain, formerly a standard practice, has been found impracticable over an average of 10 years or so, although now and then it may return the cost of the operation. Time and rates of seeding, depth of plowing, and methods of weed eradication developed at this station have been almost uniformly adopted. Varieties of wheat from all parts of the world are tested for years. Early Barrt, Turkey Red, and other standard varieties were proved adapted to eastern Oregon conditions at this station. Promising new varieties are being developed; namely, some smut-immune varieties and crosses between the Federations and more hardy varieties, in an effort to produce a wheat of winter habit with the yielding character and other excellent qualities of the Federations.

In 1909, also, there was established in cooperation with the United States Department of Agriculture, a branch station at Hermiston where cropping experiments, soil moisture experiments, and some livestock-feeding work, are conducted under irrigated conditions, and the results have wide application.

In 1911, the southern Oregon Branch Experiment Station was estab-

lished, in cooperation with Jackson county, at Talent. Here the discovery of sulphur as a fertilizer for leguminous crops was made. However, this station is largely given over to studies in the field of horticulture, mainly in pear production, as the Rogue River valley is famous for its fruits.

Also in 1911, a branch experiment station was established at Burns in a region fairly typical of more than one-third of the area of the state, commonly termed central Oregon. Experiments with cereals, forage crops, and irrigation methods in this district have largely been directed toward the determinations of varieties and practices particularly adapted to the territory served.

The John Jacob Astor Experiment Station was established in Astoria in 1913. Its purpose, as outlined in the bill establishing the appropriations, was "to investigate and demonstrate the conditions under which plants, grains, and fruits may be grown on tide lands, reclaimed swamp lands, and logged-off lands, and to determine the kinds of plants, grains, and fruits best adapted for growth on said lands." The functions of this station have been expanded to include experimental work on typical soil types generally farmed in the coast regions, and the results of this station's findings are applicable over an area of country roughly 75 miles wide and extending from the California line to the Columbia river in Oregon, and into much of the state of Washington.

The Hood River Experiment Station was established in 1913 for the purpose of investigating horticultural and pathological problems in the famous fruit-producing district.

All of the branch experiment stations are adequately supplied with land for carrying out investigations planned at the time of their establishment.

James T. Jardine has been director of the Oregon Experiment Station since 1920. He is a native of Idaho, a graduate of the Utah Agricultural College, and was for several years connected with the United States Forest Service, in charge of grazing investigations.

Strawberries

(*From Page* 10)

Just before planting, he puts on his first application of fertilizer. This is with his bone and potash mixture. He spreads it over the whole field, usually, with a wheat drill, at the rate of about 300 pounds to the acre.

His object in using the mixture, of course, is to give the plants a supply of food that will be slowly available, for it is not until the second year that he gets his crop. With a quicker acting fertilizer, used in a like amount, he finds the new plants are likely to run vines.

"You can't afford to skip any places in putting this application on," he told me pointing to a very noticeably poor spot in one patch. "I knew at the time that the drill was empty, but I didn't take the trouble to go back over it. I watched it though. And the plants there burnt up very badly. Didn't get their share of water, because they didn't have the fertilizer to make it available for them."

Then in midsummer, about July 10 to 15, he gives the Gandies a top-dressing of the bone and potash mixture at the rate of about 300 pounds to the acre. He doesn't top-dress the Missionaries, because he finds that they make good enough growth at that season without it.

The land is kept clean of all grass and weeds. Filthy land prevents a

good job of top-dressing.

"I always like to see a nice rain after the top-dressing," says Gunby.

The following spring, late March or early April, Gunby gives the patches their third application of fertilizer. This time it is 7-6-5 at the rate of about 500 or 600 pounds to the acre, on the Gandies. Not so much on the Missionaries.

The picking season lasts about four weeks, two weeks for the Missionaries and two for the Gandies. There is no intermission. Sometimes the last picking of the earlies is made after the first of the late berries.

For humus, Gunby puts in cowpeas. He plans to leave out strawberries for two years, changing off to potatoes or tomatoes. He finds it pays best to break up his patches after the first crop and not to keep them over for another year. It costs too much for one thing to keep out grass and weeds. When the cowpeas have been plowed in, he usually sows the fields to rye or oats, preparatory to putting in the potatoes or tomatoes.

In general the farm practices of Somerset county are the result of long experience. The various operations have been nicely adjusted to the local soil and the climatic conditions peculiar to the Eastern Shore, a comparatively narrow strip of land with large bodies of water on both sides.

The farmers generally understand very well the qualities of the different types of soil found in the county, and they select their fields accordingly.

America's Markets

(*From Page 7*)

been similar striking developments in production to meet the greatly increased demand for food products. Great commercial producing areas have been developed and expanded, in some cases several thousand miles from consuming markets. These include the Rio Grande valley, the Imperial valley, the Rocky Ford area in Colorado, the Florida citrus and truck areas, the Eastern Shore of Maryland, Delaware, and Virginia, the Petaluma, California poultry and egg-producing areas. Production in areas within a day's motor haul to market centers also is being stimulated.

One naturally concludes in a tour of the markets that somebody must be making money in this vast business of producing and distributing the nation's food supply. Railroads are not hauling food for the love of work, nor are wholesalers, jobbers, and retailers in business for their health. Are great commercial producing areas being expanded without profit? Competition is terrific all along the line from producer to retailer. But the producer who is using modern production and market methods is making money, as is also the distributor, whether wholesaler, jobber, or retailer, who is honest and capable in his business dealings.

This tour of the markets discloses the use of improved production and marketing methods which are placing better produce on the consumer's table. Greater use is being made of grade standards and market news. You won't find the glutted or famine markets of former days. Prices seem to be on a more stable basis. Shipping point and receiving point inspection are forcing higher standards of business ethics. There doesn't seem to be the former volume of inferior products in market receipts which resulted in such heavy financial loss to shippers before the days of scientific harvesting, packing, and shipping.

Distribution costs have practically doubled in the markets since pre-war days, due to increased wages, higher rents, and generally larger costs of do-

ing business. Whether these costs will ever be reduced short of a general letdown in industrial prosperity, is more than this writer can forecast. Indeed, the indications point to increasing costs of distribution as population increases and the distributive machinery becomes more complex. Certain physical functions in distribution must be performed whether by producers, producers' organizations, or independent wholesalers, jobbers, and retailers. The question is who can perform them best.

Many growers are attacking the distribution problem through cooperative organizations which are performing many of the distributive functions of private operators. The California Fruit Growers' Exchange, for example, maintains its own salaried agents in approximately 60 markets and reaches practically every city in the United States and Canada that is large enough to purchase citrus fruits in car lots. Before the organization of the exchange, the smaller cities were supplied, irregularly, from the larger markets in less than car lots. The cooperatives are making direct sales to chain stores, and endeavoring to induce retailers to adopt better methods of displaying fruits and vegetables.

Distribution Costs

An illuminating study of distribution costs was made recently in the New York City market, in which it was learned that 26 wholesale firms included in the survey had gross sales of fruits and vegetables for the year 1924 amounting to $34,802,309.98, or an average per firm of $1,338,550.38. Out of this total, $31,214,461.19 or 89.69 per cent was paid for the produce up to the point of city terminal delivery, leaving a balance of $3,587,848.79 to pay for cartage from rail points to the wholesale markets, storage charges, costs of distribution and salaries and profits of proprietors.

The salaries and profits of proprietors were calculated at $416,162.24 for the 26 firms, or an average of $16,006.24 per firm. There were 65 managers, partners, or proprietors in the 26 firms, who received an average salary of $5,304.96 for their year's work, or about $100 per week. If the principals had received all of the net profits above interest in addition to their salaries, each principal would have received $6,402.49 for this year's work, or about $123 per week.

Wages of employees stand out clearly as the most important item of cost of distribution in the New York area. In distributing $35,000,000 worth of produce, these wholesalers spent $1,203,648.48 for wages of employes, or nearly 39 per cent of all costs of terminal distribution. An additional $416,000 went for salaries of proprietors, and net profit. Other items of cost include $316,000 in commissions paid country agents for soliciting and handling consignments at country points, and in brokerage paid city brokers in the same or other markets for services in disposing of cars of produce.

Bad debts accounted for $215,000; bags, barrels, crates, and stencils, $152,000; rent $132,000; traveling expenses $129,000; telephone and telegraph charges $117,000; interest on investment $107,000; miscellaneous expenses $81,000, and lesser amounts ranging from $58,000 on down for depreciation and repairs, office supplies, advertising, insurance, taxes, interest on borrowed money, heat, light and power, legal fees, audits, auto expense, collection service, market news service, and inspection.

The place to get into the food game seems to be at the distribution end of the line. And yet, all is not golden even there. While the average figures indicate that a net profit was made by the 26 wholesale firms, there were actually 18 firms whose books showed a net profit, and 8 who had a net loss. The highest net profit made by any one firm, in addition to salaries of proprietors, was $24,390; the largest loss by any one firm was $25,308. These firms, also, are probably of higher grade than the average produce firm.

Generosity

(*From Page 4*)

until you have a bank roll to use as a leverage to a place among the easy-mark immortals than it is to wade right into the stream of life and be a fisher of men.

Yet do not despair. We have with us an innumerable company of big and little folks who do throw away the bait and can jump into the current to catch them by hand.

For true *spiritual generosity,* note such fine examples as Jane Addams of Hull House, Chicago; Dr. Wilfred Grenfell of Labrador; Maud Ballington Booth, of the Salvation Army—and perhaps some good neighbor of yours who speaks the soul language loud enough for you, if not the world, to hear.

To the most of us, who are of the proletariat, the heroine of fiction that typifies spiritual generosity in our own language is Mrs. Wiggs of the Cabbage Patch.

She personifies the harassed, self-sacrificing parent—and parenthood is, or ought to be, the graduate school of generosity. Not the yielding, sticky soothing-syrup kind, but that quality that can box ears with one hand and wipe away tears with the other. It is this sentimental stamina in parenthood that brings wonderful lives out of the densest tenement district or nurtures strength of character and leadership in the alfalfa.

I know of no time or place more fitting to speak of this quality than at the advent of the winter solstice in the north. A keen climate certainly has a tendency to test one's store of spiritual, patient generosity. Your tropical mammas and papas can knock down a few cocoanuts in a pinch, have no fuel troubles, and can take a siesta when home events begin to warm up.

Your temperate zone paterfamilias and his hectored spouse have lately entered the lists once more for a battle against Conditions and Circumstances. They know the truth of the adage: "It is a fact and not a theory that confronts us."

This is the battle, blow by blow:

Round One—Coats, mittens, overshoes, coal, shoes, groceries, more overshoes, insurance, more coal, gas and light bills, shoes—First Round ends; time out to check the balance.

Round Two—Rubbers, doctor bills, insurance, groceries, new shoes, coal, dentist bill, gas and light, Christmas presents!—Second Round ends; Home Defenders groggy until New Year's.

Round Three — (Principals enter smiling with holiday greetings, but ready to turn over a new leaf—in their check book.) Groceries, shoes, insurance, underwear for everybody, coal, gas and light, caps and mittens, community welfare subscription campaign, church dues, lodge dues, and real estate and income taxes. The Home Guard weakens, Mother's silk hose dream fades, Dad forgets he wants a new pipe, but the kids are clamoring to see Reginal Rinaldo in The Last of the Mazumas!

The thing that keeps you and me plugging along through a grill like that is the memory of how we once sat on the side-lines and saw another pair of household heroes try hard to be generous against even worse odds—just to keep *us* fat and sassy!

It's in the brood and in the blood, and so in this manner spiritual generosity becomes hereditary.

And isn't it a blessing that it *is* hereditary? Try to think of a single quality of heart and mind you would more generally wish to see perpetuated than well-balanced spiritual generosity. You don't have to go to Corinthians for the answer, even though it says therein that "the Lord loveth a cheerful giver."

Pessimists lament the fact that the growing generation of children are becoming either Goops or Gimmies. Caution in generosity may not be required in many cases as an admonition to parents, but where is there a sadder sight than the parent who answers "Here you are" to each and every "Give me"?

IF generosity is the ace in the parent's deck, then thrift is trumps! That's the kind of tricks to teach! Without it, half the pack are jokers and you'll have no right to ask for a new deal. Better a trace of Scotch than a race of gamblers!

While philanthropic generosity is building libraries and colleges, reckless generosity is filling our poor houses. Strange to say, that's another "close race."

Thus far we have considered only the verb "to give." Generosity covers more ground than that. Consider the most important element of generosity, which is generosity of *thinking*.

If there is anything in which Americans are niggardly about, it is in thinking. Probably if we had to pay our taxes at the polling booth we would do more thinking about statesmen and their policies, and less about golf and pinochle. If we were more generous in our thoughts—give and take—then the bloc, the klan, the union, and the clique would melt away into a pleasant period of understanding.

And so now we have come to December. It is twelve o'clock on the year's dial. Do we approach it like a spendthrift counting his last coins, or as one who considers it as a bit of interest on the principal sum invested in happiness, tolerance, and good will?

As readers of these casual lines, you have indeed been generous to me, and I think of you as I thumb the last frayed leaf on my calendar. In the words of Tiny Tim, who was poor and generous, I say in closing:

"Merry Christmas! God bless us everyone!"

Sweet Potato Wilt

(*From Page 25*)

that were refused certification were there found more than 10 wilted plants.

Sweet potato wilt is transferred almost entirely by the seed potatoes. When the diseased potatoes are bedded, the fungus that is resting within the sap tubes becomes active. It spreads rapidly into the new sprouts, but may not give any outward signs of its presence. When the diseased plants are set in the new fields, the fungus continues to act, turning the sap tubes brown and the leaves yellow. These early infected plants are usually killed in a short time but they may linger for some time, often producing fair sized potatoes. This is the serious danger of the disease because seed taken from this field will serve to propogate the disease still further.

Another serious danger is that the fungus spreads into the soil from the diseased plants. It is capable of living there for five or six years. If sweet potatoes are grown continually in the soil, it will not be long till the soil becomes so badly infected that a crop failure is practically certain.

There are but few such fields in the Indiana sweet potato region and the growers are putting forth their best efforts to fight off the inroads of the pest.

Father—"How would you like a cow for a wedding present?"

Daughter—"Oh, a cow would give more milk than we would need for two. A calf would be just right."

MAKINGS OF A SPHINX

Traveller — "Who's the close-mouthed individual over in the corner? He hasn't spoken for ten minutes."

Village Wit—"Hy Blackmore! He ain't close-mouthed. He's just waitin' till Pete comes back with the spittoon."

Cohen placed a ladder against the side of the house, and then called his son, Abie, aged seven, and made him mount to the top.

"Now jump," commanded Cohen.

"I'm frightened," replied Abie.

Cohen held out his arms.

"Do as papa tells you—jump—papa is here."

Finally Abie did jump. Cohen stepped aside, and Abie fell with a bump.

"Let that teach you a lesson never to trust anybody," said Cohen.—*The Humorist.*

TRIPLICATES

A local politician was called up at his office recently and notified that his wife had presented him with triplets. He was silent for a moment, and then boomed forth: "I demand a recount."

"He tried to cross the railroad track
Before a rushing train;
They put the pieces in a sack,
But couldn't find the brain."

House Manager—"Here it is Monday. Tomorrow will be Tuesday, and the next day Wednesday. The whole week half gone and nothing done yet."

TAKE A DARE

Futility—Trying to sell a copy of "Ask Me Another!" to the father of five small boys.

A few days after Harry's mother came home from the hospital with a brand new baby, Harry fell and broke his arm.

As the family doctor was lifting the little fellow out of the car to take him into the hospital, Harry asked the doctor if he must go in there.

"Yes, but don't worry, laddie; the hospital's a nice place and we'll soon fix you up," replied the physician.

"All right, doctor, but if I have to go to the hospital, I want a pup—I don't want a baby."—*Kablegram.*

MORE THRIFT

A New Yorker met a Scotsman, just back from the Florida golf courses, struggling up Broadway dragging an alligator.

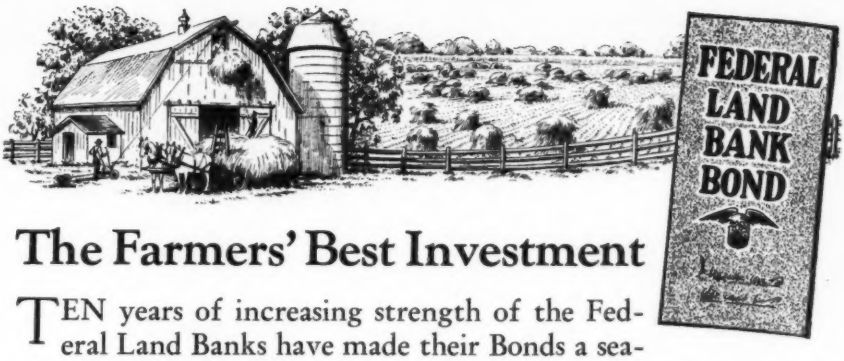
"What are you doing with that alligator?" he asked.

"The son-of-a-gun has got my ball," replied the Scotsman.

COVERS IT ALL

The Snagtown Torchlight has coined a new heading which was formerly captioned: "Births, Marriages and Deaths." The caption now reads, "Hatched, Matched and Dispatched."

The easier it is to get a man to talk the harder it is to get him to quit.



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